

FEDERAL ENVIRONMENTAL ASSESSMENT/  
SECTION 4(f) DE MINIMIS FINDING

NEW HAVEN RAIL MAINTENANCE FACILITY IMPROVEMENTS

NEW HAVEN, CONNECTICUT

STATE PROJECT NO. 301-0088

Prepared for:

The U.S. Department of Transportation Federal Transit Administration  
(Lead Agency)

and

The Connecticut Department of Transportation  
(Grantee/Project Sponsor)

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## ACRONYMS AND ABBREVIATIONS

ACHP.....	Advisory Council on Historic Preservation	NEPA .....	National Environmental Policy Act
ADA .....	Americans with Disabilities Act	NGVD .....	National Geodetic Vertical Datum
ADT .....	Average Daily Traffic	NHPA.....	National Historic Preservation Act
ASRS.....	Automated Storage and Retrieval System	NHRY .....	New Haven Rail Yard
CCMA.....	Connecticut Coastal Management Act	NRCS .....	Natural Resource Conservation Service
CEPA .....	Connecticut Environmental Policy Act	NRHP .....	National Register of Historic Places
CFHA.....	Coastal Flood Hazard Area	OPM .....	State of Connecticut Office of Policy and Management
CFR.....	Code of Federal Regulations	PE .....	Preliminary Engineering
CGS.....	Connecticut General Statutes	PM .....	Particulate Matter
CHC .....	Connecticut Historical Commission	RCSA .....	Regulations of Connecticut State Agencies
CMAQ.....	Congestion Mitigation Air Quality	ROW .....	Right-of-Way
CTDOT ....	Connecticut Department of Transportation	RTP .....	Regional Transportation Plan
CTDEP .....	Connecticut Department of Environmental Protection	SF .....	Square Foot
EA .....	Environmental Assessment	SHPO.....	State Historic Preservation Officer
EIE .....	Environmental Impact Evaluation	S&I .....	Service and Inspection Shop
EMU.....	Electrical Multiple Unit	SIP .....	State Implementation Plan
EPA .....	U.S. Environmental Protection Agency	STIP.....	Statewide Transportation Improvement Program
FEMA .....	Federal Emergency Management Agency	SWPPP .....	Stormwater Pollution Prevention Plan
FTA.....	Federal Transit Administration	TIA .....	Transportation Investment Area
GIS .....	Geographic Information System	TSB .....	Transportation Strategy Board
LOS .....	Level of Service	USACE.....	United States Army Corps of Engineers
MHWL.....	Mean High Water Line	USFWS ....	United States Fish & Wildlife Service
MNR .....	Metro-North Railroad		
MPO .....	Metropolitan Planning Organization		
MTA.....	Metropolitan Transportation Authority		
NAAQS....	National Ambient Air Quality Standards		
NDDB .....	Natural Diversity Database		

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## EXECUTIVE SUMMARY

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**Project Name:** New Haven Rail Maintenance Facility Improvements, New Haven, Connecticut

**Date:** March 2009

**Lead Agencies:** Federal Transit Administration (FTA)  
Connecticut Department of Transportation (CTDOT)

### **Regulatory Context**

The New Haven Rail Maintenance Facility Improvements, as described below, will be financed with both federal and state funds, and as such, is subject to the regulations and guidance established by both the National Environmental Policy Act (NEPA) of 1969, as amended (42 USC 4321 *et seq.*) and the Connecticut Environmental Policy Act (CEPA) (Connecticut General Statutes [CGS] Sections 22a-1 through 22a-1h, inclusive, and where applicable, CEPA regulations Section 22a-1a-1 through 22a-1a-12, inclusive, of the Regulations of Connecticut State Agencies [RCSA]). Under NEPA, the subject document is an Environmental Assessment (EA) and under CEPA, it is an Environmental Impact Evaluation (EIE). The EA/4(f) includes documentation of project compliance with Section 106 of the National Historic Preservation Act and with Section 4(f) of the U.S. Department of Transportation Act. Under NEPA, this EA will be released for a 30-day public review period. If no significant impacts are identified, CTDOT will send the EA and any comments received to FTA with a recommendation of a Finding-of-No-Significant Impact (FONSI).

### **Description of the New Haven Rail Maintenance Facility Improvements**

The New Haven Rail Maintenance Facility Improvements (Proposed Action) is the construction of new facilities at the New Haven Rail Yard (NHRY) to serve the existing and future fleet of rail cars. The facilities are proposed to be built on approximately 74 acres of state-owned land that comprises the existing NHRY site. The Proposed Action is located within an area roughly bounded by Union Avenue to the west, Cedar and Hallock Streets to the south, Church Street Extension and Brewery Street to the east, and Route 34 to the north (see Figure 1 — Site Location). Specific details of each of the new facilities and associated site improvements are included in Chapter 4 of this EA/4(f). Existing facilities on the NHRY are shown in Figure 2. Elements of the Proposed Action are illustrated in Figure 3.



# NEW HAVEN RAIL YARD FACILITIES IMPROVEMENTS



**FIGURE 2 -  
EXISTING CONDITIONS**

SCALE IN FEET  
SCALE 1"=40'

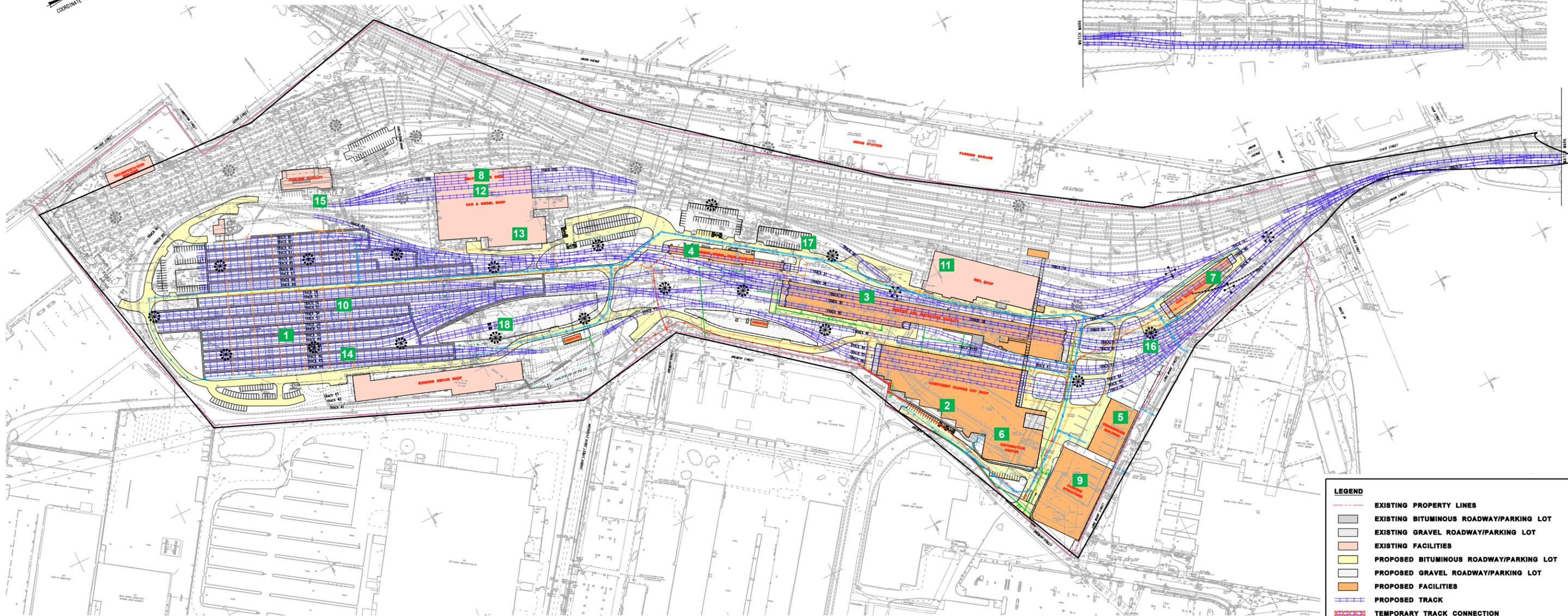
IN-PROGRESS FOR INFORMATION ONLY  
8-01-2007

- LEGEND**
- - - - EXISTING PROPERTY LINES
  - EXISTING BITUMINOUS ROADWAY/PARKING LOT
  - EXISTING GRAVEL ROADWAY/PARKING LOT





# NEW HAVEN RAIL YARD FACILITIES IMPROVEMENTS



LEGEND	
	EXISTING PROPERTY LINES
	EXISTING BITUMINOUS ROADWAY/PARKING LOT
	EXISTING GRAVEL ROADWAY/PARKING LOT
	EXISTING FACILITIES
	PROPOSED BITUMINOUS ROADWAY/PARKING LOT
	PROPOSED GRAVEL ROADWAY/PARKING LOT
	PROPOSED FACILITIES
	PROPOSED TRACK
	TEMPORARY TRACK CONNECTION
	PROPOSED DRAINAGE
PROPOSED UNDERGROUND UTILITIES	
	WATER
	SEWER
	GAS
	POWER

**FIGURE 3 -  
PROPOSED ACTION**

SCALE IN FEET  
SCALE 1"=80'

IN-PROGRESS FOR INFORMATION ONLY  
1-09-2007





CTDOT is the owner and commuter rail authority for the New Haven Rail Line, which is the Connecticut portion of the Metro-North Railroad (MNR). MNR operates the New Haven Line and its engines and rolling stock under a service agreement with CTDOT. CTDOT is responsible for programming and funding, as well as maintenance and upkeep of the New Haven Line's engines and rolling stock. The Proposed Action will provide the facilities to service the new M-8 fleet of rail cars, as well as the existing M-2, M-4, and M-6 rail cars. As the current fleet of aging rail cars (M-2s) is phased out, CTDOT will replace them with the next generation of rail cars (M-8s). The M-2 fleet (dating to the 1970s) was only designed to operate for 30 years. The M-8 cars require different maintenance facilities than the M-2s. The project incorporates both the new facilities and improvements to the existing facilities.

In order to construct the new facilities, demolition of three existing structures will be necessary: Building 10, the water treatment plant, and the Wheel True Mill. Building 10 will remain in service until after the completion of the Component Change-Out Shop in 2012. The building will be demolished to permit space for additional yard tracks, as will the "Onion." The "Onion," the water treatment plant used in the past for on-site construction at the NHRY, is scheduled to be used during the construction period (for the Fuel Facility, and possibly other facilities as well). The water treatment plant will eventually be dismantled and removed from the site. After the construction of the new Wheel True Shop, the existing Wheel True Mill will be demolished.

The Proposed Action consists of the following elements as shown in Figure 3, summarized in Table 1 and described as follows:

#### New Components

1. Twenty-five new storage yard tracks located within the existing loop track west of the Church Street Bridge will be constructed. The new storage tracks will connect to the existing loop track, to the existing car and diesel shops, and to the New Haven Main Line track to the east.
2. A component change-out shop, with three tracks capable of holding 13 rail cars and adjacent support shops, is to be constructed in the southeast portion of the site, next to a new distribution warehouse and south of the new Service and Inspection shop. The component change-out shop will also include MNR and CTDOT offices, MNR training facilities, communications equipment, and security facilities.
3. A two-track, 10-car Service and Inspection (S&I) shop, located south of the existing Electrical Multiple Unit (EMU) shop, will be constructed. The existing EMU shop currently services the existing fleet of M-2 rail cars. A new wheel true shop with a tandem wheel true machine will be constructed within the Service and Inspection shop.
4. A second wheel true shop with a tandem wheel true machine will be constructed in the vicinity of the former Amtrak power plant.
5. A maintenance-of-way building providing offices, headquarters, and shops for the MNR engineering department will be constructed on the southeast corner of the NHRY site.
6. A material distribution warehouse will be attached to the component change-out shop.
7. A rail car washer will be constructed east of the existing EMU shop.

8. A heavy repair/paint shop will be constructed that will abut the existing diesel shop in the west-center of the rail yard within the existing car shop.

9. A new parking garage with 350 new spaces will be constructed to the east of the new component change-out shop.

In addition, an employee overpass will be constructed to link the parking structure, the component change-out shop, the Service and Inspection shop, and the EMU shop with the existing Union Station Platform D. This will facilitate safe movement of employees within the rail yard.

Improvements, revisions, and additions to the network of utilities, roads, walkways and railroad systems to support the new facilities will also be constructed.

#### Improvements to Existing Components

In addition to the newly constructed facilities, several existing components in the NHRV will become part of the improved, coordinated facility. These facilities include:

10. Storage yards
11. The EMU shop
12. The car shop
13. The diesel shop

Other existing buildings will become part of the improved facility and have been documented for NEPA as Categorical Exclusions.

#### Components to Be Eliminated or Replaced

In order to construct the new facilities, demolition or replacement of existing structures will be necessary:

14. Building 10 (demolition)
15. Diesel tanks (replacement)
16. Propane tanks (replacement)
17. Wheel True Mill (demolition)
18. The "Onion" -- the water treatment plant (demolition)

**Table 1: New Haven Rail Yard Components**

<b>Figure 3 Locator Number</b>	<b>New Components</b>	<b>Purpose</b>
1	New Storage Yard Tracks	Storing and dispatching of rail cars
2	Component Change-Out Shop with Support Shops	Repairing and maintaining rail cars
3	Service and Inspection (S&I) Shop	Maintaining and inspecting rail cars
4	Independent Wheel True Shop	Maintaining rail car wheels
5	Maintenance-of-Way Building	Headquarters, including offices and common work areas
6	Material Distribution Warehouse	Storing materials on pallets
7	Rail Car Wash Facility	Cleaning of rail cars
8	Heavy Repair/Paint Shop	Repairing and painting of rail cars
9	Parking Garage	Employee parking
<b>Improvements to Existing Components</b>		
10	Storage Yards	Storing and dispatching rail cars
11	Electrical Multiple Unit (EMU) Shop	Servicing current fleet of rail cars
12	Car Shop/ Critical Systems Repair (CSR)	Component change-out, servicing, and retrofitting M-2 rail cars
13	Diesel Shop	Servicing Shore Line East rail cars
<b>Components to Be Eliminated</b>		
14	Building 10/Stores Building	Demolish to provide space for new rail tracks
15	Diesel Tanks	Replaced
16	Propane Tank	Replaced
17	Wheel True Mill	Demolish
18	Water Treatment/Dewatering Facility	Demolish

Source: Fitzgerald & Halliday, 2006.

Several divisions within CTDOT, including the Office of Rail, Environmental Planning, Property and Facilities, and Environmental Compliance, discussed alternatives during project siting and design development. The MTA Police Department was also involved in discussions. These discussions resulted in the following project parameters being agreed upon, among others:

- The new facilities will be designed to current CTDOT design standards to the greatest extent practicable, including Guidelines for Highway Design; Location Survey Material; Traffic Signal Manual; Standard Roadway Drawings and List of Road Standards; Manual for Selecting, Locating, and Designing Guide Railing and Traffic Barriers; and Standard Specification for Roads, Bridges and Incidental Construction (Form 816) & Supplemental Specifications.

- The new facilities will be designed according to the State of Connecticut Building Code (2005), as adopted pursuant to CGS 29-252, as amended, and the Connecticut Fire Safety Code (2005), as adopted pursuant to CGS 29-292, as amended, and Applicable Codes and Standards published by the National Fire Protection Association.
- The new facilities will meet the 2003 International Energy Conservation Code, the 1997 International Plumbing Code, the 1996 International Mechanical Code, and Applicable Codes and Standards published by American National Standards Institute (ANSI), the American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE), the Illumination Engineering Society of North America (IESNA), Underwriters Laboratories, Inc., the International Electrical Testing Association (NETA), The Lighting Protection Institute, and the Occupational Safety and Health Administration.
- American Railway Engineering and Maintenance-of-Way Association (AREMA) and Metro-North Standards will be followed where applicable. These include the following: Metro-North Railroad's, Standards for Track Construction and Maintenance, AREMA Manual for Railway Engineering 2006, AREMA Portfolio of Trackwork Plans 2004, and Conrail Standard Plans for Turnouts.
- American Association of State Highway and Transportation Officials (AASHTO) guidelines will be observed for site/civil design including: Policy on Geometric Design of Highways and Streets, Guidelines for Driveway Design and Location, and Design of Pavement Structures.
- Institute of Transportation Engineers (ITE) Parking Generation

Several ongoing projects within the rail yard have been addressed and documented for NEPA purposes as Categorical Exclusions: Project No. 301-097 Locomotive Fuel Facility, Project No. 300-0131 Temporary M-8 Acceptance Facility, and Project No. 301-T190, EMU/CSR Shop Code Upgrades. The recent demolition of the Amtrak power plant was a separate state-funded project. A CEPA document was prepared for State Project No. 301-0081 Interim Rail Car Service & Inspection Facility, which is now up and running. In addition, coordination with the following state projects must occur: Project No. 301-T106 New Haven Fuel Facility, Project No. 301-0089 Shore Line East New Haven Rail Yard Security Project.

### **Purpose and Need**

The purpose of the proposed Action is to transform and expand the existing NHRV into a fully functional and coordinated facility that provides for efficient and effective storage, dispatching, inspection, maintenance, and cleaning of an increasing fleet of rail cars. The improvements will provide the space, equipment, and administrative support structure needed to operate and maintain a new generation of rail cars and will coordinate the new facilities with the existing facilities. CTDOT's proposed program of improvements to the NHRV will support rail transit services in Connecticut well into the twenty-first century.

Goals and objectives of the Proposed Action are:

- to provide maintenance shops and facilities (including new equipment) for new fleet of M-8 rail cars
- to provide yard space for acceptance and storage of new fleet of M-8 rail cars
- to improve existing facilities at the rail yard by providing a coordinated yard complex
- to continue current operations at the rail yard
- to maximize safety and efficiency of storage, dispatching, inspection, maintenance and cleaning of rail cars
- to support the provision of reliable MNR and Shore Line East service and encourage commuter use of rail

The new generation of M-8 EMU rail cars will replace the existing M-2 fleet of cars, originally procured in the early 1970s. The M-2 cars were designed to operate for 30 years and have exceeded their life expectancy. The increase in the fleet size will overwhelm the already inadequate rail car maintenance and inspection facilities and the rail yard tracks needed to store and prepare train sets for revenue service. The Proposed Action will address existing compliance, location, operational and space deficiencies. Chapter 4 of this document, Description of the Proposed Action, provides more detailed information on the current and future fleet size and number of current and future maintenance and storage spots available/required.

New Haven's location as the northeastern-most terminus of the MNR rail line logically dictates efficiency in providing storage, dispatching, inspection, maintenance, cleaning and support functions. In addition, this terminus operates on an approximately 74-acre parcel of land that currently functions as a rail yard owned by CTDOT, and is, in effect, the connecting point for Shore Line East and the proposed New Haven-Hartford-Springfield lines.

### **Summary of Anticipated Impacts and Mitigation Measures**

The implementation of the Proposed Action, although it involves many components, will have minor adverse environmental impacts that can be mitigated. Table 2 summarizes the anticipated impacts from the Proposed Action along with proposed mitigation measures.

**Table 2: Summary of Anticipated Impacts and Mitigation Measures for Proposed Action**

<b>Resource</b>	<b>Impact Synopsis</b>	<b>Mitigation</b>
Land Acquisitions and Displacements	There are no Land Acquisitions or Displacements. One utility easement will be relocated within State of Connecticut Right of Way.	None needed.
Land Use and Zoning	There are no adverse impacts on Land Use or Zoning	None proposed.
Consistency with State, Regional and Local Plans	The Proposed Action is consistent with state, regional, and local plans.	None proposed.
Environmental Justice/Title VI	There are no adverse impacts to low-income or minority Environmental Justice populations	None proposed.
Socio-Economic Conditions	There are no adverse impacts on Socio-Economic Conditions. The Proposed Action will bring additional jobs to the area, which will have a Socio-Economic benefit.	None proposed.
Community/Neighborhoods	There are no adverse impacts to Community or Neighborhoods.	None proposed.
Air Quality	There are no adverse impacts to Air Quality.	None proposed.
Noise	There are no adverse impacts from Noise.	None proposed.
Traffic, Transit, and Parking	There are no adverse impacts on Traffic, Transit, or Parking. Rather, the ultimate goal of the Proposed Action is to create an improved rail yard, better equipped to service the public rail transportation system.	None proposed.
Pedestrian and Bicycle Considerations	There are no adverse impacts to Pedestrians and Bicyclists.	None proposed.
Section 106 Resources	There are no adverse impacts on Section 106 resources.	None proposed.
Section 4(f) Resources	There are no adverse impacts to Section 4(f) resources.	None proposed.
Visual/Aesthetic Effects	There are no adverse impacts on Visual/Aesthetic resources.	None proposed.
Public Safety and Security	There are no adverse impacts on Public Safety and Security. Security will be improved, with a greater police presence.	None proposed.
Critical Environmental Areas and Threatened and Endangered Species	There are no adverse impacts to Critical Environmental Areas or Threatened and Endangered Species.	None proposed.
Water Resources and Water Quality	Due to increased treatment of site stormwater runoff, and site remediation activities, there are no adverse impacts on water quality.	Due to site constraints, mitigation measures are limited. A stormwater pollution prevention plan will be designed and implemented in accordance with the 2002 <i>Connecticut Guidelines for Erosion and Sedimentation Control</i> (CT DEP) and the <i>Connecticut Stormwater Quality Manual</i> (CT DEP, 2004).
Wetlands	A total of 10,130 SF (0.232 acre) of inland wetlands will be filled.	The functions of the wetland, to trap and remove sediments contained in stormwater runoff and to provide flood storage capacity, will be replaced by the NHRYS stormwater management system. Permit obtained 1/14/08.
Floodplains and Stream Channel Encroachment Lines	There will be impacts to the 100-year floodplain.	Some flood storage capacity will be replaced by the NHRYS stormwater management system. Coordination will occur with CTDEP on Flood Management Certification and other required permits. Certified 11/14/07.
Farmlands	There are no adverse impacts on Farmlands.	None proposed.
Wild & Scenic Rivers, Navigable Waterways and Coastal Resources	There will be impacts to the coastal flood hazard area. There are no impacts to Wild and Scenic Rivers or Navigable Waterways.	CTDEP coastal consistency review is required. Coordination will occur with CTDEP on permit issues. A coastal consistency review has been completed for the M-8 acceptance facility. Coastal consistency reviews will be done systematically for each and every future project within the NHRYS.
Public Utilities and Services	There are no adverse impacts to Public Utilities.	None proposed.

<b>Resource</b>	<b>Impact Synopsis</b>	<b>Mitigation</b>
Environmental Risk Sites and Hazardous Materials	Based on a Phase I Site Assessment, the existing NHRV is a potential source of contamination due to historic land use.	Potential risks will need to be further evaluated in more detailed site investigations conducted by a Licensed Environmental Professional (LEP) as the design of the Proposed Action advances. The findings of these investigations will dictate the need for a remedial action plan.
Construction Impacts	There are temporary construction period adverse impacts to: Community and Neighborhoods, Air Quality, Noise, Traffic, Water Quality, and Public Utilities and Services.	A construction phasing and sequencing plan will be developed to ensure that impacts are minimized. The following plans will be developed: Maintenance and Protection of Traffic Plan, Erosion and Sedimentation Control Plan, noise abatement measures in accordance with CTDOT Form 816, Health and Safety Plan. Coordination with the City of New Haven and utility providers will take place.
Secondary and Cumulative Development Impacts	There will be a secondary, beneficial impact to the state's rail transportation system. There will be a cumulative, beneficial impact to Socio-economic Conditions. There will be adverse cumulative impacts to: Wetlands, Floodplains, and the Coastal Flood Hazard Area.	Careful future project planning, alternatives analysis, and avoiding and/or minimizing impacts will be utilized to counteract cumulative impacts.

The Proposed Action is essential for the efficient operation of CTDOT's New Haven Line and its branches. The need to provide for storage, dispatching, inspection, maintenance, and cleaning of the fleet of rail cars is an important part of keeping Connecticut's transportation infrastructure in top working condition to the benefit of all of the state's residents. The improvements will provide the space and equipment needed to maintain a new generation of rail cars and allow for more efficient, coordinated operations.

Potential adverse effects from the Proposed Action include wetland impacts, increased stormwater runoff from new impervious surfaces, work within the coastal flood hazard area, and construction-period impacts relative to noise, air quality, traffic, stormwater, and public utilities and services. These impacts will be mitigated through proper management of materials and resources during and after construction, adherence to all applicable local, state, and federal regulations, and through ongoing coordination with resource agencies. Through its impact avoidance and mitigation measures, the Proposed Action will not incur any significant environmental, cultural, or social impacts.

### **Review Period and Comments**

Review agencies and other interested parties were offered an opportunity to provide comments and other pertinent information to help define environmental impacts, interpret the significance of such impacts, and evaluate alternatives. The circulation list for the EA/4(f) is included in Appendix C. Written comments on this document and any other pertinent information was requested to be submitted to the agency contact listed below by delivery or postmark by July 9, 2008. A public hearing on the Proposed Action was held on June 25, 2008 at Gateway Community College (60 Sargent Drive) in Room 160, New Haven, Connecticut.

The submitted materials and responses, along with the Executive Summary of the EA/4(f), have been forwarded to the Federal Transit Administration (FTA) for a determination of its adequacy. After a 30-day public review of this document, the FTA can make a Finding-of-No-Significant-Impact (FONSI) if the Proposed Action would not result in significant impacts.

### **Agency Contacts**

Federal Transit Administration  
Ms. Brigid Hynes-Cherin  
One Bowling Green, Room 429  
New York, NY 10004-1415  
Telephone: (212) 668-2170  
Fax: (212) 668-2136

Connecticut Department of Transportation  
Mr. Edgar T. Hurle, Transportation Planning Director  
Office of Intermodal and Environmental Planning  
2800 Berlin Turnpike, P.O. Box 317546  
Newington, CT 06131-7546  
Phone: (860) 594-2005  
Fax: (860) 594-3377  
E-Mail: [edgar.hurle@po.state.ct.us](mailto:edgar.hurle@po.state.ct.us)

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# 1 PROJECT BACKGROUND

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Connecticut's Transportation Strategy Board (TSB) was established in 2001 to develop statewide strategies to "strengthen and expand the State's transportation system over the next 20 years to enhance Connecticut's prospects for sustainable economic growth and a premier quality of life." The TSB created five regional planning areas in Connecticut called Transportation Investment Areas (TIAs). The City of New Haven falls within two TIAs, the Coastal Corridor Transportation Investment Area (CCTIA) and the Interstate 91 TIA. Section 3(d) of Public Act 01-5, *An Act Implementing the Recommendations of the Transportation Strategy Board* (the Act), mandated that the participants in each TIA prepare a TIA Corridor Plan.

These transportation corridor plans put forth a 20-year strategy for enhancing the TIA's transportation system. The plans also created a linkage between each TIA strategy and transportation projects endorsed by the TSB as eligible for a share of the funds appropriated in the state's budget.

One of the key observations of the *Twenty-Year Strategic Plan for Transportation in the Coastal Corridor Transportation Investment Area* (Coastal Corridor TIA Board, November 6, 2002, and subsequent 2004 update) is that congestion on highways in the Coastal Corridor is severe, particularly on the westerly portion of Interstate 95. The plan concludes that there is an opportunity to develop alternative modes of transportation in the corridor, including rail, to help address the many issues raised by this congestion. The plan notes that rail lines extend throughout the Coastal Corridor, but are not being utilized to the extent of their capacity, either for people or freight, although they are in urgent need of major capital investment. The plan makes a general recommendation to increase the commitment to transit in the region.

One of the CCTIA Plan's top five recommendations is: "Mitigate congestion on I-95 by increasing the number of trips by rail by ordering new rail cars immediately, developing additional storage and maintenance facilities as needed for a larger fleet and improve rail station access."

One of the top five recommendations of the *Interstate 91 Transportation Investment Area Corridor Plan* (September 26, 2002, and subsequent 2004 update) is the following: "upgrade trains, maintenance facilities, parking facilities, and feeder bus services for passenger rail service in the state, particularly along the Metro-North Passenger Rail Line. Upgrades should not be at the expense of other existing services, such as the Shore Line East commuter service. Specifically, we should fund needed commuter rail equipment on the New Haven line and provide additional parking for commuters at an Orange or West Haven rail station." Subsequently, State funding and CEPA documentation for West Haven has been approved. Federal funding and NEPA documentation for Orange has also been approved.

In addition, in CTDOT's *2004 Long Range Transportation Plan for the State of Connecticut 2004–2030*, “construction of new rail maintenance facilities in New Haven” was identified as a specific action to be taken over the next decade.

The Proposed Action is the culmination of extensive alternatives analyses of improvement projects to meet the goals and recommendations described in these plans.

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## 2 PURPOSE AND NEED

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The purpose of the Proposed Action is to transform the existing NHRY into a fully functional facility that provides for efficient and effective storage, dispatching, inspection, maintenance and cleaning of an increasing fleet of rail cars. The improvements will provide the space, equipment, and administrative support structure needed to operate and maintain a new generation of rail cars and will coordinate the new facilities with the existing facilities. CTDOT's proposed program of improvements to the NHRY will support improved rail transit service in Connecticut well into the twenty-first century.

Goals and objectives for the Proposed Action are:

- to provide maintenance shops and facilities (including new equipment) for new fleet of M-8 rail cars
- to provide yard space for acceptance and storage of new fleet of M-8 rail cars
- to improve existing facilities at the rail yard by providing a coordinated yard complex
- to continue current operations at the rail yard
- to maximize safety and efficiency of storage, dispatching, inspection, maintenance and cleaning of rail cars
- to support the provision of reliable MNR and Shore Line East service and encourage commuter use of rail

An overall program has been initiated to raise the quality of rail service through procurement of a new generation of M-8 Electric Multiple Unit (EMU) rail cars that will replace the existing M-2 fleet of cars, originally procured in the early 1970s. The M-2 cars were designed to operate for 30 years and have exceeded their life expectancy.

The larger fleet size will overwhelm the already inadequate rail car maintenance and inspection facilities and the yard tracks needed to store and prepare train sets for revenue service. Chapter 4 of this document, Description of the Proposed Action, provides more detailed information on the current and future fleet size and number of current and future maintenance and storage spots available/required. The New Haven Line is vital to the transportation network of the State of Connecticut in providing a viable alternate means of transportation other than highways. Governor M. Jodi Rell has led the initiative of rail improvements to get commuters off of I-95. Updated maintenance facilities in the best location are essential to providing reliable service and encouraging commuters to use the system.

Train sets for New Haven Line service are stored and dispatched from Grand Central Terminal, Stamford, Bridgeport and New Haven. New Haven, as the eastern/northern terminus of the MNR rail line, is a strategic location for providing storage, dispatching, inspection, maintenance, cleaning and support functions. New Haven also connects MNR with Shore Line East and the proposed New Haven-Hartford-Springfield Lines. In addition, the NHRY is located on an approximately 74-acre parcel of land already owned by CTDOT, most of which is already in use as a rail maintenance and storage facility.



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## 3 ALTERNATIVES CONSIDERED

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### 3.1 BACKGROUND

Because the existing NHRY and other facilities along the New Haven Line and its branches are not currently equipped to provide all of the maintenance, repair, storage, dispatching, inspection, and cleaning functions for the existing and incoming fleet of rail cars, CTDOT recognized the need to upgrade existing facilities and/or provide new facilities for the fleet. CTDOT also recognized the benefits of coordinating and consolidating these functions in one location. Several locations were explored to meet these needs.

Concept plans for the Proposed Action were developed by CTDOT and MNR after careful consideration of three build alternatives. The Proposed Action site is the New Haven Rail Yard because it is situated at the eastern/northern terminus of the MNR New Haven Line and the property is already in CTDOT ownership. Although the site is space constrained, it can accommodate the facilities deemed necessary to meet the project's purpose with impacts to wetlands that are less than the other alternatives. Additionally, the preferred alternative concept provides operational and environmental advantages over other alternative configurations that were considered for the site, while still remaining cost effective.

The proposed project upgrades an existing facility and maintains the function at its current location, which is in an existing commuter rail yard. The rail yard is located directly adjacent to the main commuter rail station in New Haven, which provides convenient and efficient access for operations.

New Haven's location as the northeastern terminus of the rail line logically dictates efficiency in providing storage, dispatching, inspection, maintenance, cleaning and support functions. In addition, this terminus operates on land already owned by CTDOT, and is, in effect, the connecting location for Shore Line East and the proposed New Haven-Hartford-Springfield Lines.

Alternative locations that were also given consideration include Grand Central Terminal in New York City and the Cedar Hill rail yard in New Haven. Grand Central Terminal, the western terminus of the New Haven Line, was eliminated from further consideration for the improved facilities because there is limited space within Grand Central Terminal, and CTDOT does not own property there.

The Cedar Hill Rail yard, adjacent to I-91 in New Haven, was one of the subjects of the *2002 Fleet Configuration Analysis* which studied Metro-North's New Haven Rail Line to help determine locations for new facilities and needs for improvements at existing facilities. Several disadvantages over the Proposed Action became apparent in that study, including:

- Greater distance from the end of the service line
- Lack of electrification for traction power

- Potential soil contamination issues,
- Property is not in CTDOT ownership
- Space limitations
- Only access is over Amtrak right-of-way
- Considerable wetlands and floodplain impact to obtain access.

Because of the constraints and problems associated with the other locations, the NHRY was selected as the preferred site of the Proposed Action.

### **3.2 NO-BUILD ALTERNATIVE**

The No-Build Alternative would be a continuance of existing conditions and does not meet the Purpose and Need. It is included in this document for baseline comparison.

The No-Build Alternative would involve no new construction, and as a result, no significant environmental impacts would occur from this alternative. This alternative includes retrofitting, maintenance and rehabilitation of existing facilities. These activities would be targeted at maintaining a good state of repair and complying with current life safety codes, and to continue the basic services of the rail yard. The limited improvements (retrofit and rehabilitation) would include code and condition upgrades to the existing shops (EMU Shop, CSR Shop, existing Wheel Truing Facility) and minor sitework and utility improvements to repair defective underground facilities.

Under the No-Build Alternative, the NHRY would not accommodate the new fleet of M-8 rail cars. The new rail cars have maintenance and inspection requirements that differ dramatically from the characteristics of the cars in the current fleet and therefore require different facilities. In addition, the seating capacity of the new vehicles is less than the vehicles being replaced, so the fleet size will be increased accordingly. The EMU fleet is projected to increase by about 120 vehicles. The current yard space and shop facilities are not suitable for the new fleet of cars for the following reasons:

- Storage tracks in the yard are currently filled to capacity. Adding more cars to the fleet requires the construction of additional tracks for storage, inspection, cleaning and dispatching.
- The existing wheel profiling capacity on the New Haven Line is inadequate to meet the demands of today's fleet of vehicles. The new vehicles require a higher tolerance on wheel profiles increasing the demand for this function.
- There is only one single-axle drop table on the entire New Haven Line severely limiting the ability to perform work on trucks and axles.
- The new vehicles will be equipped with roof-mounted air conditioning units. The current shops do not have sufficient overhead cranes to remove and replace these units nor the support shops required to maintain and test these units.
- There are no car washing facilities in New Haven.

- There are no facilities on the New Haven Line to paint rail cars.
- The existing maintenance shops in New Haven currently run continuously. Increasing the fleet size and the characteristics of the vehicles requires larger and fundamentally different shops than are now in place at New Haven.

In summary, the new cars have a different set of maintenance requirements than the previous fleet of cars. The space and equipment needed for the both existing and incoming fleet of rail cars could not be provided in the existing configuration under the No-Build Alternative, and CTDOT would be unable to meet the maintenance, repair, storage, dispatching, inspection, and cleaning needs for the fleet on the New Haven Line and its branches. With no new facilities to store or service the new rail cars, which are an integral part of this project, the Purpose and Need of the project would not be met.

### **3.3 BUILD ALTERNATIVES FOR THE PROPOSED ACTION**

Several early layout concepts were developed for the three build alternatives for the proposed improvements at the NHRY. Early concepts considered:

- A wheel true machine incorporated within the running repair/component change-out shop instead of within the Service and Inspection (S&I) shop
- A rail car wash located immediately northeast of the EMU shop and a redundant crossover from the north leg of the loop track to the diesel shop
- A rail car wash located on a diagonal alignment east of the EMU shop requiring that the east shop tracks be shortened and realigned to the north
- Elimination of the redundant crossover to the diesel shop to provide for additional at-grade parking within the site for employees working in the car and diesel shops, EMU shop, second wheel true shop and the service and inspection shop
- A concept allowing the existing support shop building located east of the EMU shop to remain; this space is currently used for offices
- Fewer car spots on the tracks east of the EMU shop
- Accommodation for a blow shed adjacent to the rail car wash.

After extensive coordination with MNR and the CTDOT Office of Rail, these early concepts were subsequently revised in favor of the current layout reflected in the Proposed Action, which meets the Purpose and Need with the greatest efficiency and the least impacts to resources.

The proposed major building locations are severely limited due to the size and configuration of the property, the location of existing buildings and track, and operational requirements, such as the need to provide double-ended shops. The proposed locations of the two major new buildings, the Component Change Out (CCO) and S&I shops, are basically the only locations that satisfy all of the desired criteria. The track access to the west end of the CCO shop will require filling the wetland. The tracks must be raised more than four feet above the wetland to match the first floor elevation of 10.4 feet, which is 1 foot above the 500-year flood elevation as required by DEP flood standards for a critical activity. The track locations cannot be moved due to geometry restrictions and the need to provide connections between all shop tracks and storage yard tracks. In particular, the three tracks exiting the west end of the CCO Shop must connect to

each other, then connect into the loop track, which then must provide a cross connection to the storage yard tracks in the center of the yard.

Because portions of the existing NHRY are located in the floodplain, it was not feasible to only evaluate alternatives that would keep all construction out of the floodplain. However, floodplain impacts were minimized as much as possible during the design process by reducing the footprint and volume of fill of individual components.

Several divisions within CTDOT, including the Office of Rail, Environmental Planning, Property and Facilities, and Environmental Compliance, discussed alternatives during project siting and design development. The MTA Police Department was also involved in discussions. These discussions resulted in the determination of what elements would be included in the Preferred Alternative for the Proposed Action.

### **3.4 SELECTION OF THE PREFERRED ALTERNATIVE**

The site of the Proposed Action is the New Haven Rail Yard. It is the preferred location because it is situated at the northeastern-most terminus of the MNR New Haven Line and the property is already in CTDOT ownership. Although the site is space constrained, it can accommodate the facilities deemed necessary to meet the Proposed Action's purpose with impacts to wetlands that are less than the other alternatives. Additionally, the preferred alternative concept provides operational and environmental advantages over other alternatives configurations, while still remaining cost effective. These operational and environmental advantages of the Preferred Alternative, over the other alternatives, include:

- One location for coordinated maintenance, repair, storage, dispatching, inspection, and cleaning for the existing and incoming fleet of rail cars
- Location is directly adjacent to the main New Haven Union Station so trains can be dispatched directly to platform tracks and serviced/stored immediately upon completion of revenue service runs
- Location is at the end of the New Haven Line
- Already has electrification for traction power
- Property is already owned by CTDOT
- Less total wetland and floodplain impact than the other alternatives.

Under the preferred alternative, new facilities will be constructed to meet the maintenance, repair, storage, dispatching, inspection, and cleaning needs for the both the existing and incoming fleet of rail cars. The selected alternative includes seven new buildings, 25 new storage tracks, and a new parking garage with approximately 350 new parking spaces. The new facilities, in coordination with upgraded existing facilities, will meet the needs of CTDOT staff and operations, enabling more adequate handling of the existing and incoming fleet of rail cars. In summary, the selected alternative (described in detail in Chapter 4 of this EA) is preferred because it best meets the Proposed Action's Purpose and Need.

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## 4 DESCRIPTION OF THE PROPOSED ACTION

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The New Haven Line of the Metro-North Railroad (MNR) is one of nation's premier commuter rail lines, as well as one of its busiest. The Connecticut portion of the New Haven Line runs from the Connecticut-New York state line to Union Station in New Haven. The NHRY is located in the Long Wharf section of the city of New Haven, in close proximity to New Haven Harbor to the east and Downtown New Haven to the northwest. Interstate 95 (I-95) and Interstate 91 (I-91), are two major interstate transportation corridors located east and northeast respectively of the Proposed Action site.

The NHRY is located on approximately 74 acres of land currently owned by CTDOT. The NHRY is surrounded by a study area roughly bounded by Union Avenue to the west, Cedar and Hallock Streets to the south, Church Street Extension and Brewery Street to the east, and Route 34 to the north (see Figure 1, Site Location, in the Executive Summary).

CTDOT is the owner and commuter rail authority for the New Haven Rail Line, which is the Connecticut portion of the Metro-North Railroad (MNR). MNR operates and maintains the New Haven Line and its engines and rolling stock under a service agreement with CTDOT. CTDOT is responsible for programming and funding, as well as maintenance and upkeep of the New Haven Line's engines and rolling stock. The Proposed Action will provide the facilities to service the new M-8 fleet of rail cars, as well as the existing M-2, M-4, and M-6 rail cars. As the current fleet of aging rail cars (M-2s) is phased out, CTDOT will replace them with the next generation of rail cars (M-8s). The first deliveries of these new rail cars will take place in Mid-2009. The M-2 fleet (dating to the 1970s) was only designed to operate for 30 years. The M-8 cars require different maintenance facilities than the M-2s. The Proposed Action incorporates both the new facilities and improvements to the existing facilities.

To provide for the new maintenance and upkeep needs of the M-8 rail cars, improvements (including new equipment) are needed at the NHRY Maintenance Facility. Additional yard space is also critically important for the acceptance and ultimate storage of the new M-8 cars. The current EMU storage capacities are 123 for New Haven, 75 for East Bridgeport, and 180 for Stamford. However, by 2025, with increasing M-8 use, space will be needed for 120 additional EMU rail cars.

The Proposed Action will transform the 74-acre NHRY into a coordinated facility, providing for the efficient and effective storage, dispatching, inspection, and maintenance of existing M-2 and new M-8 rail cars. Existing rail yard facilities are shown in Figure 2 in the Executive Summary. Elements of the Proposed Action are illustrated in Figure 3 in the Executive Summary.

Table 1 in the Executive Summary provides detailed information relative to the Proposed Action.

In order to construct the new facilities, demolition of three existing structures will be necessary: Building 10, the water treatment plant and the Wheel True Mill. Building 10 will remain in service until after the completion of the Component Change-Out Shop in 2013. The building will be demolished to permit space for additional yard tracks, as will the "Onion." The "Onion," the

water treatment plant used in the past for on-site construction at the NHRV, is scheduled to be used during the construction period (for the Fuel Facility, and possibly other facilities as well). The water treatment plant will eventually be dismantled and removed from the site. After the construction of the new Wheel True Shop, the existing Wheel True Mill will be demolished.

The Proposed Action is comprised of the following new components as shown and numbered on Figure 3 in the Executive Summary:

**1. New Storage Yard Tracks:** Twenty-five new storage tracks are proposed to be constructed within the loop track west of the Church Street Overpass:

- Eight of the tracks will be non-electrified tracks used to store and dispatch diesel-powered train sets. Although the New Haven Line is electrified, diesel-powered trains are still used on branch lines and for Shore Line East service.
- Thirteen of the tracks will be powered by AC overhead catenary and would be used by EMU equipment.
- Four tracks, located in the middle of the yard, would be allocated for new M-8 rail car acceptance activities, with two tracks non-electrified and two tracks electrified. Space at the west end of these four tracks will be reserved for temporary offices and storage.

The new track configuration will have connections to the loop tracks, EMU shop, car and diesel shops, running repair shop, the coal bridge ladder, and to the main line. A few yard switches, remotely controlled by the yardmaster to expedite train movements to and from the main line, are proposed at the easternmost part of the yard. These twenty-five new storage tracks will have in-ground toilet serving stations which empty to the City of New Haven Sanitary Sewer System.

By 2010, an estimated nine diesel trains will be stored on the storage tracks, each coming into and out of the storage tracks each day. At least one electric train will enter and leave each of six tracks per day (and six per night) for a daily total of 12 electric train movements in and out of the storage tracks.

**2. Component Change-Out Shop with Support Shops:** The 48,500 square foot (SF) shop area of component change-out is configured as a three-track “run-through” facility. The facility will provide the capability to lift 13 rail cars for repairs and component replacements. Equipment will include thirteen vehicle lifts, sixteen turn-tables, and two fifteen-ton overhead cranes. Access to the building is proposed from a secure entrance with a guard booth off Brewery Street.

The 26,600 SF stores area within the component change-out shop will serve as the distribution point in the main maintenance and repair facility for repairing, cleaning, and servicing. The area also will include loading docks for highway vehicles.

The facility also will include restrooms, locker rooms, break rooms, administrative offices, storage areas, and building services. Space for MNR training, CTDOT offices, a cafeteria, and the MTA police are also provided in this facility.

Support shops, configured to repair vehicle components such as HVAC units, pantographs, tread brakes, trucks, and electrical components, are also proposed. Support areas for the component change-out shop include:

- A truck shop, equipped with a storage track and turn-tables for efficiently moving trucks requiring service and installation. Access will be provided to the component cleaning area to prepare the trucks for overhaul or heavy repair. This area will include truck hoists to facilitate efficient repair, disassembly and reassembly.
- An enclosed component cleaning area for pre-cleaning large components, such as rail vehicle trucks, prior to disassembly and repair or shipment.
- A brake shop for cleaning, disassembly, repairing, reassembly, and testing brake units and actuators.
- An air room for cleaning, inspecting, troubleshooting, repairing, rebuilding, painting, and testing all types of brake valves and air brake system components.
- An enclosed, temperature-controlled clean room/electronics shop equipped to clean, troubleshoot, repair, and test electronics components.
- A HVAC unit repair shop used to repair the components associated with air conditioning units.
- A pantograph repair area used to repair the components associated with electrical propulsion energy collection components.
- A battery room which supports the disassembly, cleaning, testing, and reassembly of multi-cell battery units.

**3. Service and Inspection (S&I) Shop:** This 85,200 SF facility is proposed to be located immediately north of the component change-out shop. Two tracks, each with 10-car capacity, will be used for mandated inspections and routine maintenance tasks. The tracks will have center-track pits and side platforms to permit access to the undercarriage and roof of the cars. The facility will include a stores area for parts storage, restrooms, locker rooms, and break rooms, administrative offices, common work areas, and building services, such as information technology and communications. The facility will include a tandem wheel truer to accommodate the increased wheel profile demands of the new M-8 rail cars. It is estimated that two electric trains will move through the S&I shop per day, and two per night.

**4. Independent Wheel True Shop:** This separate facility, proposed to be located west of the S&I shop in the center of the yard, will provide for redundancy and function to fully meet the requirements of the New Haven Line fleet. Its function is to return wheel diameter parity and profile from the stresses of track wear, drift, spalling, and wheel flat spots. The wheel true machine is located within a pit, and the vehicles pull over the machine for mounting. In addition to the shop area, the facility includes storage areas, restrooms, administrative offices, and building services.

**5. Maintenance-of-Way Building:** This 23,600 SF facility will provide headquarters, offices, shops, common work areas, and storage for the engineering departments. The facility will also include rest rooms, locker rooms, and break rooms, as well as building services. The engineering departments provide for the maintenance of the facilities and equipment at the NHRY. This engineering building is proposed to be located east of the component change-out facility.

**6. Material Distribution Warehouse:** The new warehouse, attached to the component change-out shop, will be an automated facility. An automated storage and retrieval system (ASRS) allows for compact storage of standardized shipping pallets and bins by reducing the circulation aisle width, increasing usable height, and utilizing push-back storage. The ASRS would occupy an area that is 60 foot (ft.) wide by 120 ft. long by 70 ft. high and would contain 3,640 pallet storage positions with a capacity of 2,500 pounds (lbs.) each. This configuration utilizes two retrieval trucks, 10 racking columns, and two and three deep push-back racking.

**7. Rail Car Wash Facility:** A rail car washer is proposed to be located in the eastern portion of the site, situated to allow trains operating through the wash to have access to all of the storage yard tracks without blocking other yard movements. This 12,800 SF facility includes a restroom, administrative offices, wash equipment and tanks, and building services. Like a passenger car wash, the rail car wash is activated when the rail cars enter the facility. A spray arch distributes a cleaning chemical, then the car moves through a series of scrub brushes, a rinse arch, and finally a stripper chemical is applied. The facility will be designed for automatic operation. Drip pans will collect runoff material. Chemical waste will be transported for off-site disposal.

**8. Heavy Repair/Paint Shop:** This 39,500 SF facility will include a heavy repair shop and a paint shop to be constructed within the existing car shop. The heavy repair shop, which will accommodate repairs to rail cars, will house two five-ton capacity overhead cranes. The existing car shop will be reconfigured to provide a four-track shop with six car spots and four portable lift jack sets. Two car spots are proposed for painting, along with a self-contained paint booth. The facility will also include common work areas, storage areas, restrooms, locker rooms, and break areas, as well as administrative offices and building services.

**9. Parking Structure:** A parking garage will be provided to accommodate automobiles used by workers for MNR, MTA, Amtrak, and state employees. The parking garage is proposed to be located east of the component change-out shop. A pedestrian overpass is proposed to link the parking garage with the component change-out shop, S&I shop, and the existing EMU shop to station Platform D. The overpass will provide for safe pedestrian movement between facilities.

**10-13.** In addition to these new components, the Proposed Action will incorporate several existing buildings into the coordinated and improved NHRY. These existing facilities include rail storage yards (#10 on Figure 3), the EMU shop (#11 on Figure 3), the car shop (#12 on Figure 3), and the diesel shop (#13 on Figure 3).

**14. Building 10/Stores Building Demolished:** The existing warehouse for the New Haven Line is located in a portion of Building 10, in the southwestern part of the site. Building 10 will be demolished as part of Phase 2 of the Proposed Action (see Project Schedule, section 4.2 of this document), and electrified storage tracks will subsequently utilize this space. A new warehouse will be attached to the component change-out shop.

**15-18.** Other existing facilities that will be demolished as part of the Proposed Action are the dewatering facility, also known as the “onion,” (#18 on Figure 3), which was only constructed for short-term operation, the wheel true mill (#17 on Figure 3), and a few diesel and propane tanks (#15 and #16, respectively, on Figure 3). The dewatering facility will be used for construction of the Proposed Action, and then demolished.

#### **4.1 PROJECT FUNDING**

The Proposed Action will be financed with both federal (Federal Transit Administration) and state funds. The total cost estimate for the Proposed Action is \$1.1 billion. The cost estimate for Phase 1 is \$628 million.

#### **4.2 PROJECT SCHEDULE**

The Proposed Action is being constructed in two phases. The proposed improvements in Phase 1 will be designed and constructed under a series of construction contracts over a period of several years that follows the construction schedule below. This is being done to match funding availability and staging requirements in order to maintain existing operations during construction. The proposed projects include:

<b>Facility Description</b>	<b>Construction Schedule</b>
Temporary M-8 Acceptance	March 2008 – March 2009
West End Yard	March 2013– May 2015
Independent Wheel True	Nov 2009 – October 2011
Component Change Out Shop	July 2009 – August 2012
East End Yard	Feb 2014 – March 2016

The first component of the Proposed Action, the Temporary M-8 Acceptance Facility, began construction in January 2008 using state funding. The majority of demolition and utility work has also begun. Construction for Phase 1 is scheduled to be completed by the end of 2016. Phase 1 of the Proposed Action includes the following:

- Component change-out shop with offices, training, and shop facilities
- Service and inspection shop with wheel true facility
- Rail car washer facility
- M-8 tracks and temporary facilities
- Independent wheel true facility
- Near-term renovations to the car shop and the EMU shop
- Although Building 10 will eventually be demolished sometime after 2016, near-term renovations will be done to make sure that the facility can be used until that time
- Limited train storage yard

- East-end track connection to the main line and control of yard switches
- Site utilities and drainage improvements for the entire site
- Paving and surface improvements
- Traction power electrical upgrades for the initial track work
- Employee/pedestrian overpass connecting the component change-out shop, the S&I shop, the EMU shop, and Union Station Platform D.

Phase 2 of the construction is anticipated to take place beginning sometime after the completion of Phase 1 in 2015. Construction for Phase 2 is anticipated to be completed in 2022. Phase 2 will consist of the remaining improvements, including:

- Reconstruct and convert the car shop into a heavy repair/paint shop
- Material distribution warehouse
- Parking garage
- Maintenance-of-Way building
- Completion of storage tracks, yard tracks, and associated catenary system elements
- Demolition of Building 10
- Completion of site utilities
- Completion of paving and surface improvements
- Extension of employee/pedestrian overpass from the component change-out shop to the parking garage.

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## 5 LAND ACQUISITIONS AND DISPLACEMENTS

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### 5.1 EXISTING SETTING

All work will be done on CTDOT-owned property. Utility easements will be moved by acquiring new rights-of-way and releasing old easements for the Power/Communication line relocations along Brewery Street.

### 5.2 DIRECT AND INDIRECT IMPACTS ON LAND

#### **No-Build Alternative**

No property acquisitions or displacements would be required under the No-Build Alternative.

#### **Proposed Action**

Utility easements will be moved along Brewery Street. The utility easement will be relocated within state-owned property. No property acquisitions or displacements would be required for the Proposed Action.

### 5.3 MITIGATION

As no property acquisitions or displacements are required, no mitigation is necessary.

### 5.4 SUMMARY OF IMPACTS

There are no land acquisitions, displacements, or impacts.



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## 6 LAND USE AND ZONING

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### 6.1 EXISTING SETTING

#### Land Use

The Proposed Action will occur in the City of New Haven, largely in the Long Wharf section of the city. The Proposed Action site is adjacent to the Hill neighborhood, which borders the NHRY site on the west. The site is bounded by Union Avenue to the west, Cedar and Hallock Streets to the south, Church Street Extension and Brewery Street to the east. Some of the proposed railroad track improvements extend north of Route 34. The railroad tracks north of Route 34 divide Downtown New Haven and the Wooster Square neighborhood.

According to field observation and the existing land use map in the City of New Haven's Comprehensive Plan of Development (October 15, 2003), the Proposed Action area is characterized by a complex urban mix of residences, restaurants, commercial and office spaces, as well as governmental and educational institutions (see Figure 4).

The Proposed Action is within the footprint of the existing NHRY. The existing rail yard is comprised of an EMU shop, support shops, a blow shed, a wheel true facility, a transportation building, a car shop, a diesel shop, office and training spaces, an interim running repair shop, a fueling facility, operating and storage yards. Union Station, with Metro-North and Amtrak commuter services, operates on the site, and fronts on Union Avenue. The train station houses some retail and fast food uses. A parking garage, operated by the New Haven Parking Authority, connected to the train station, is also located on the property. All of this land is owned by CTDOT.

#### *Hill Neighborhood*

The Hill neighborhood is defined by Hallock Avenue, Cedar Street, and Union Avenue to the east, Route 34 to the north, Long Island Sound to the south, and the West River to the west. The Hill neighborhood is one of New Haven's oldest, densest, and most distressed in terms of housing vacancies and foreclosures. On Union Avenue, there is a planned residential development, Church Street South Apartments, and a seven-story apartment building, to the northwest of the Proposed Action site. The New Haven Police Department, several multi-level parking garages, surface parking areas, and office buildings are also located west of the NHRY. Yale School of Nursing and Tower One East (a high-rise residential apartment building) are located northwest of the site.

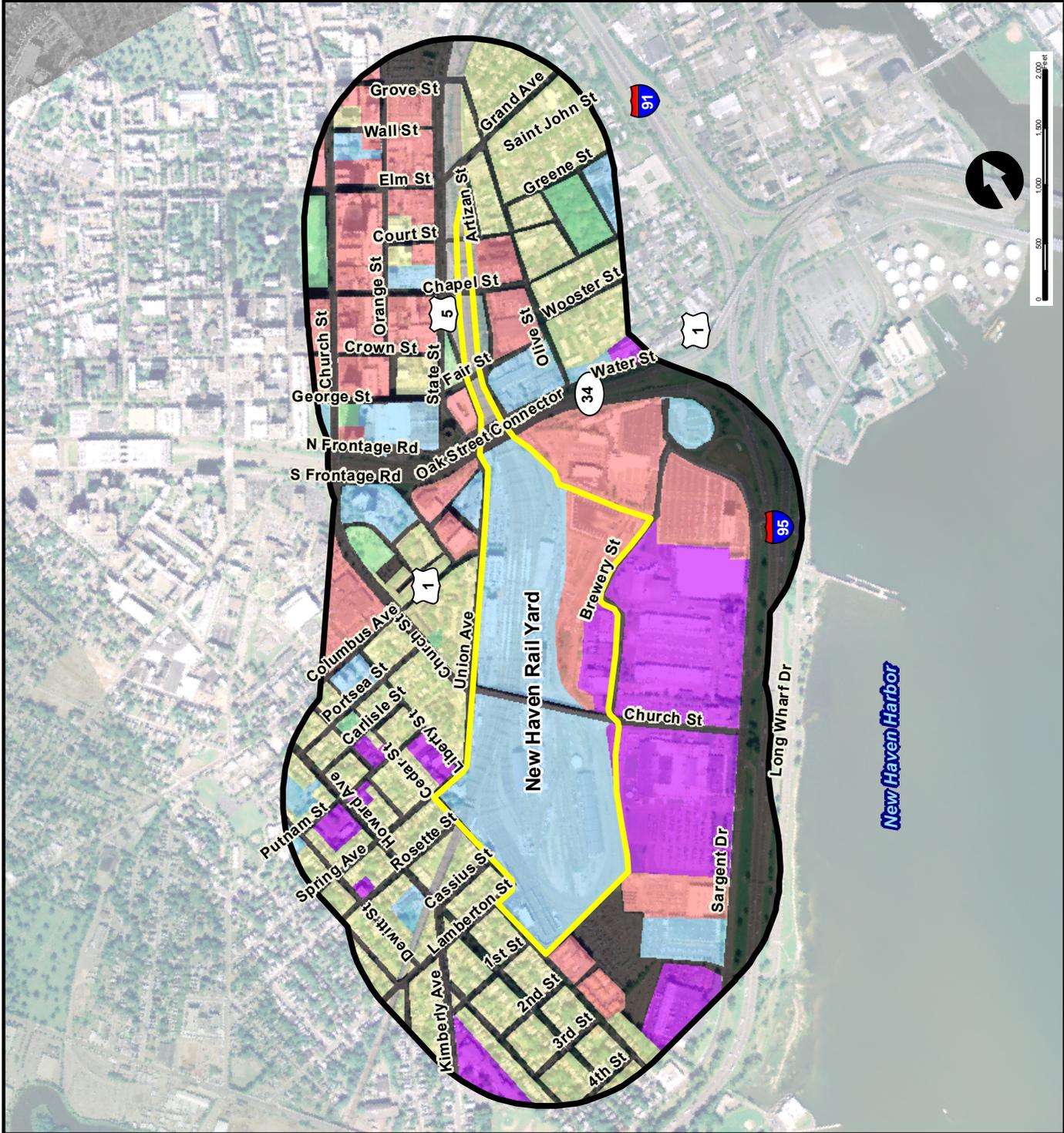


**Figure 4  
Existing Land Use**

New Haven Rail Yard EA/EIE  
New Haven, CT  
State Project # 301-0088




- Rail Yard Property
- Study Area
- Commercial
- Industrial
- Residential
- Institutional/Public
- Open Space/Recreational
- Rail
- Roads/Pavement





New Haven Rail yard (looking north) from the EMU shop.

The Hill neighborhood is characterized by predominantly residential uses, along with churches, schools, parks, and numerous corner stores and restaurants. There are also convenience businesses such as laundromats, cleaners, gas stations, auto repair shops, hair salons, and barber shops.

### *Long Wharf*

The Long Wharf area and New Haven Harbor are located to the east of the Proposed Action site. Long Wharf, with port and transportation access to I-95 to the east, is largely an industrial area with some commercial, governmental, and institutional uses. Land uses in Long Wharf include storage and warehousing, manufacturing and production, commercial, and business offices. There has been some adaptive re-use of buildings, converting former industrial facilities to commercial or office space. Table 3 provides a list of some of the land uses in Long Wharf.

Gateway Community College is currently east of the site of the Proposed Action in the Long Wharf area; however, there are plans to move the campus into Downtown New Haven by 2011. The former Pirelli Company building is also in this area, and there are plans to convert this space to office building uses.

**Table 3: Long Wharf Land Uses**

<b>Type of Use</b>	<b>Land Use</b>
Industrial	New Haven Food Terminal
	Assa Abloy/Sargent Manufacturing Company
	Connecticut Freezers
	Hummel Brothers Plant
Commercial/Restaurant/Hotel/Banking	Mobil gas station/Dunkin Donuts
	Brazi's Restaurant
	Sage Grill and Oyster Bar
	Marriott Residence Inn
	Marriott Fairfield Inn
	Connecticut National Bank
	IKEA
Governmental/Institutional/Non-Profit	U.S. Postal Service
	Yale New Haven Long Wharf Medical Center
	Gateway Community College
	Long Wharf Theater
	Long Wharf Dental Group
	Gaylord Rehab Center and Sleep Services
	New Haven Register
	South Central Regional Water Authority
	Department of Mental Retardation
	Children's Community Programs of Connecticut
	Agency on Aging of South Central Connecticut
	Hazwaste Central

Source: Fitzgerald & Halliday, 2006.

*Downtown New Haven*

Some of the proposed railroad track improvements extend north of Route 34 within a cut section containing active railroad tracks. Route 34 separates the Hill neighborhood and the Long Wharf area from Downtown New Haven. Downtown New Haven's central business district is characterized by mixed uses. The New Haven Green, city hall and several other government buildings, banks, office buildings, and retail uses are located on Church Street.

State Street, which runs parallel to the railroad tracks to the west, is characterized by multi-story buildings with commercial uses at the street level and residential and office uses on the upper floors. The area between State and Church Streets, south of Chapel Street, is known as the "Ninth Square," and is characterized by first floor artist and dance studios, pocket parks, a farmer's market, shops and markets, salons, and restaurants and bars, with mixed-income residential uses on the upper floors. Channel 8 and other news media have offices in this area.

There are several parking garages and surface parking lots in this area of Downtown New Haven. There is one surface parking lot located between State Street and the railroad tracks (just south of Chapel Street) and one center island surface parking lot between State Street North and State Street South (just south of Crown Street).

There is also a train station, State Street Station, located on State Street north of Chapel Street. The station consists of a pull-off for vehicles and a drop-off area for passengers. A pedestrian walkway allows users to access the platforms. There is a small protected area where passengers can purchase tickets and pick-up travel information.

The site formerly occupied by the New Haven Coliseum is proposed as the future location of Long Wharf Theatre and a hotel and conference center. The Knights of Columbus own adjacent properties.

### *Wooster Square Neighborhood*

The railroad tracks separate Downtown New Haven from the Wooster Square neighborhood. Wooster Square, a historic district, provides single-family and multi-family homes, condominiums, brownstones and other apartment buildings. Former factories have been put to adaptive reuse for residential and office uses. Wooster Street, widely known for its Italian and pizza restaurants, also contains stores, hair salons, and office spaces. Wooster Square Park and two smaller parks are located in the Wooster Square neighborhood. Other uses in this neighborhood include churches, funeral homes, florist and bakery shops. Closer to the downtown area, there are more commercial uses (i.e., Firestone Tire) and services such as Comcast customer center.

### Zoning

According to the City of New Haven's City Plan Department and the City Plan Commission, the site of the Proposed Action is zoned BE (Wholesale & Distribution) and IL (Light Industry). These zones, shown in Figure 5, are described as follows by the Zoning Ordinance (City of New Haven, June 5, 2005):



**Table 4: New Haven Zoning Categories and Descriptions**

<b>Zoning Category</b>	<b>Zoning Description</b>
BE (Wholesale & Distribution)	These districts furnish goods and services that are mainly used in support of retail trade for the city and the region. The principal activities located here are wholesaling, warehousing, transportation, heavy business services, distribution, and some incidental processing. Such functions are generally located in such a position that they can support the Central Business Districts and at the same time concentrate their heavy traffic requirements near the main arteries for movement of goods and services.
IL (Light Industry)	These districts, in common with other business and industrial districts, are regulated by a set of performance standards prescribing upper limits for nuisance factors such as noise and smoke. Industries are permitted which keep within those limits, as well as business uses which generally support and are integrated with other uses in such districts. Further development of residences is prohibited from these districts, in order to conserve the supply of heavy commercial and industrial land and to prevent residences from being established under strongly adverse conditions.
BA (General Business)	These districts serve several functions. They provide central concentrations of convenience goods and services for one or more neighborhoods, supplemented by more scattered stores for such goods and services within the neighborhoods provided for under a special provision of the regulations for residence districts. They provide comparison shopper's goods, specialty goods, amusements and numerous services for less than a citywide market. And they also provide locations for small businessmen with a city-wide market who cannot operate in the downtown area. The predominant purpose of all these functions is retail trade.
RM 1 (Residential Low-Middle Density)	This zone is for the protection of areas that have been and are being developed predominantly for low-middle density dwellings of various types.
RM 2 (Residential High-Middle Density)	This zone provides for the protection of areas that have been and are being developed predominantly for high-middle density dwellings of various types.

Source: City of New Haven Zoning Ordinance, 2005.

Surrounding adjacent land to the east is zoned IL (Light Industry), BE (Wholesale & Distribution), and BA (General Business). Land to the south is zoned RM 1 (Residential Low-Middle Density). Land to the west is zoned BE (Wholesale & Distribution), BA (General Business), and RM 2 (Residential High-Middle Density).

There are mixed residential developments, or “Planned Development Districts” to the east, to the south, and to the northwest of the Proposed Action. These developments provide greater

flexibility for integrating commercial elements, such as convenience stores, laundromats, and other uses next to residential uses.

North of Route 34 and to the west of the railroad tracks is the City of New Haven's central business district (zoned BD and BD-1 which allows residential uses). North of Route 34 and to the east of the railroad tracks is zoned BA (General Business), RM 2 (High-Density Residential), and IL (Light Industry).

## **6.2 DIRECT AND INDIRECT IMPACTS ON LAND USE AND ZONING**

### **No-Build Alternative**

The No-Build Alternative would be a continuance of existing conditions, such that no direct or indirect impacts relative to land use or zoning would occur.

### **Proposed Action**

#### Land Use

Impacts to land use were evaluated based on the effect that the Proposed Action will have on compatibility of land uses, land use patterns, and access to land. The Proposed Action will occur entirely within the boundaries of the existing NHRV and is consistent with and complementary to the existing activities at the site.

The residential and business areas located adjacent to the Proposed Action currently co-exist with the NHRV facility. It is anticipated that the Proposed Action will not adversely impact any land use patterns or access to land, including these residential and business areas.

#### Zoning

The State of Connecticut is not required to comply with local zoning regulations. However, CTDOT strives to develop its projects in a manner that does not conflict with local zoning objectives. The Proposed Action is consistent with zoning designations in the study area. Activities associated with the Proposed Action, such as transportation land uses, storage, and light industry, are allowed on the site of the NHRV.

## **6.3 MITIGATION**

The Proposed Action will not result in any adverse land use effects and will not conflict with local zoning; therefore, no mitigation is proposed.

## **6.4 SUMMARY OF IMPACTS**

The Proposed Action will not have an adverse impact on Land Use or Zoning.

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## 7 CONSISTENCY WITH STATE, REGIONAL, AND LOCAL PLANS

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The Proposed Action site falls within three successively larger planning regions, namely the City of New Haven, the South Central Regional Council of Governments (SCRCOG), and the State of Connecticut. The State of Connecticut's Transportation Strategy Board, CTDOT, and the Office of Policy and Management each have plans for guiding land use and transportation investments in the state.

The plans formulated at each level (local, regional, and state) articulate a vision, goals, and objectives for future land use and/or the transportation system. Key relevant findings of policy and planning reports developed for these regions are summarized below.

### 7.1 EXISTING PLANS

#### City of New Haven

The City of New Haven's *Comprehensive Plan of Development* (October 15, 2003) (Plan) articulates goals and objectives for transportation, as well as future land use, conservation, and development. Those that are relevant to the Proposed Action include:

- Considering the impact of new development on the existing urban fabric, relative to traffic, noise, public convenience, public safety, aesthetics, site design, and layout.
- Enhancing public transportation systems.
- Encouraging transportation activity, including construction, construction staging, and expansion, within existing rights-of-way.
- Design and subsequent construction of the Harborside Trail, with connections to a Fair Haven and Quinnipiac River trail system.

In addition, the Plan encourages minimizing environmental impacts through environmentally friendly building design (i.e., through Energy Star, LEED certification) and pollution control.

#### South Central Regional Council of Governments

The SCRCOG planning region includes 15 communities in south-central Connecticut. A key policy of the SCRCOG's regional plan of conservation and development, *Vision for the Future: Regional Plan of Development* (November 15, 2000) is to encourage "effective transit investment that delivers a good transit product through the central corridor focused on Downtown New Haven."

The agency is required by federal regulation to prepare a long-range transportation plan for the region and update it at least every three years. This plan, *Mobility: A Transportation Plan*, was last updated in 2004 and covered the period from 2004 to 2028. The key relevant policy reads as follows:

- Build on current rail commitments. Build a significant transit presence in the dense I-95 corridor. More parking, new stations, and Downtown New Haven distribution improvements can make rail a more meaningful regional and interregional travel option.

### Connecticut Transportation Strategy Board Action Plan

Connecticut's Transportation Strategy Board (TSB) was established in 2001 to develop statewide strategies to "strengthen and expand the State's transportation system over the next 20 years to enhance Connecticut's prospects for sustainable economic growth and a premier quality of life". The TSB created five regional planning areas in Connecticut called Transportation Investment Areas (TIAs). The City of New Haven falls within two TIAs, the Coastal Corridor Transportation Investment Area (CCTIA) and the Interstate 91 TIA. Section 3(d) of Public Act 01-5, *An Act Implementing the Recommendations of the Transportation Strategy Board* (the Act), mandated that the participants in each TIA prepare a TIA Corridor Plan.

These transportation plans define a 20-year strategy for enhancing the TIA's transportation system. The plans also created a linkage between each TIA strategy and transportation projects endorsed by the TSB as eligible for a share of the funds appropriated in the state's budget.

**Coastal Corridor Transportation Investment Area:** One of the key observations of the *Twenty-Year Strategic Plan for Transportation in the Coastal Corridor Transportation Investment Area* (Coastal Corridor TIA Board, November 6, 2002, and subsequent 2004 update) is that congestion on highways in the Coastal Corridor is severe, particularly on the westerly portion of Interstate 95. The plan concludes that there is an opportunity to develop alternative modes of transportation in the corridor, including rail, to help address the many issues raised by this congestion. The plan notes that rail lines extend throughout the Coastal Corridor but are not being utilized to the extent of their capacity, either for people or freight, although they are in urgent need of major capital investment. The plan makes a general recommendation to increase the commitment to transit in the region.

One of the plan's top five recommendations is: "Mitigate congestion on I-95 by increasing the number of trips by rail by ordering new rail cars immediately, developing additional storage and maintenance facilities as needed for a larger fleet and improve rail station access."

**Interstate 91 Transportation Investment Area:** One of the top five recommendations of the *Interstate 91 Transportation Investment Area Corridor Plan* (September 26, 2002, and subsequent 2004 update) is the following: "upgrade trains, maintenance facilities, parking facilities, and feeder bus services for passenger rail service in the state, particularly along the Metro-North Passenger Rail Line. Upgrades should not be at the expense of other existing services, such as the Shore Line East commuter service. Specifically, we should fund needed commuter rail equipment on the New Haven line and provide additional parking for commuters at an Orange or West Haven rail station."

## Connecticut Department of Transportation

In CTDOT's 2004 *Long Range Transportation Plan for the State of Connecticut 2004–2030*, “construction of new rail maintenance facilities in New Haven” was identified as a specific action to be taken over the next decade.

## Connecticut Office of Policy and Management

The *Conservation and Development Policies Plan for Connecticut (2005–2010)* (C&D Plan) contains economic, environmental quality, and public service infrastructure guidelines and goals for the State of Connecticut. The overall strategy of the Plan is to reinforce and conserve existing urban areas, to promote staged, appropriate, sustainable development, and to preserve areas of significant environmental value. The *Locational Guide Map* which accompanies the Plan provides a geographical interpretation of the state's conservation and development policies.

As depicted on the 2005–2010 *Locational Guide Map*, the NHRY site is labeled “Rail Station” and is located within a Conservation Area. Conservation Areas include large areas of the state with various land resources. Proper management of these lands allows the state the opportunity to provide for future needs for food, water, and other resources.

The State Action Strategy for Conservation Areas is: Plan and manage, for the long-term benefit, the lands contributing to the state's need for food, fiber, water, and other resources, open space, recreation, and environmental quality and ensure that changes in use are compatible with the identified conservation values.

The C&D Plan also contains six broad growth management principles and related policies to guide future development. Those pertinent to the Proposed Action include:

Principle — Redevelop and revitalize regional centers and areas with existing or currently planned physical infrastructure.

- Policy: Focus land patterns inward, utilizing existing infrastructure to build on the community's assets.

Principle — Concentrate development around transportation nodes and along major transportation corridors to support the viability of transportation options.

- Policy: Continue to schedule rehabilitation, expansion, and maintenance activities for the New Haven Line including track, bridges, catenary, shops, and yards, as well as upgrading railroad crossings.
- Policy: Complete major transportation projects identified in the Connecticut Master Transportation Plan contingent upon economic feasibility and successful environmental review of benefits and costs, including evaluation of secondary growth impacts induced by the Proposed Action. Major transportation proposals include New Haven Line catenary replacement, transportation crew facility, and fiber optic communication network.

## **7.2 CONSISTENCY DETERMINATION**

### **No-Build Alternative**

The No-Build Alternative would not support the improvements to the NHRY, which are needed to improve the state's rail system. The No-Build Alternative is not consistent with the goals and recommendations expressed in local, regional, and state plans.

### **Proposed Action**

The Proposed Action is consistent with the vision, goals, and recommendations expressed in local, regional, and state plans for future development of the City of New Haven and the Proposed Action site. The Proposed Action would provide for the efficient and effective storage, dispatching, inspection, maintenance, and cleaning of the fleet, including the new generation of M-8 rail cars.

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## 8 ENVIRONMENTAL JUSTICE/TITLE VI

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### 8.1 EXISTING SETTING

The U.S. Department of Transportation has a policy to insure nondiscrimination under Title VI of the Civil Rights Act of 1964. The specifics of Title VI are that “no person in the United States shall, on the ground of race, color, or national origin be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance.” Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, was issued in 1998. The Order states “each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations.”

U.S. Census Bureau (Census) data (2000) were used to determine the presence or concentration of environmental justice (minority and low-income) populations in the Census Tracts and Block Groups which surround the Proposed Action site (the study area). The U.S. Census Block Groups that comprise the study area and the environmental justice populations within this study area are shown in Figure 6. The largest minority category included in the study area is Black or African American. Table 5 provides information about environmental justice populations in the study area, compared to the larger surrounding areas.

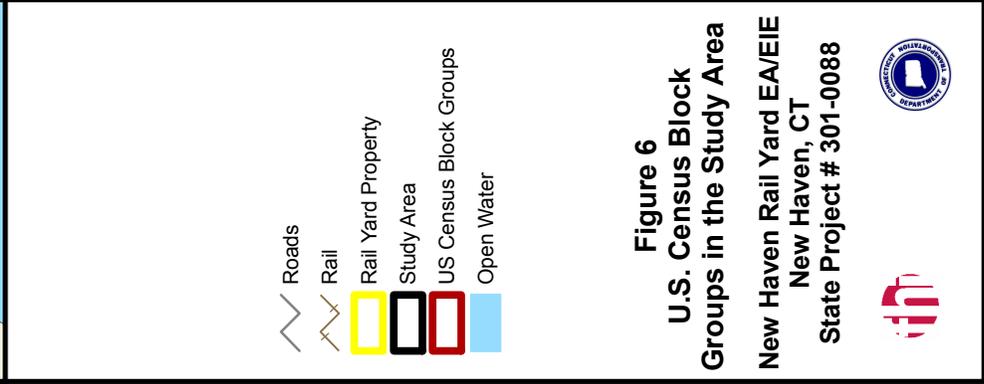
**Table 5: Comparison of Environmental Justice Populations**

	Study Area	New Haven	SCRCOG New Haven		
			Region	County	Connecticut
<b>Population</b>	6,890	123,626	546,799	824,008	3,405,565
<b>Minority</b>	4,373	69,546	105,045	170,294	627,771
<b>Percent Minority</b>	63.47%	56.26%	19.21%	20.67%	18.43%
<b>Below Poverty*</b>	2,195	27,613	51,203	75,733	259,514
<b>Percent Below Poverty</b>	31.86%	22.34%	9.36%	9.19%	7.62%
<b>Median Household Income</b>	\$27,700**	\$29,604	\$62,859**	\$48,834	\$53,935

\*Poverty is defined by the Census as \$8,500 per capita annually or less

\*\*Median Household Income derived by averaging from multiple sources.

Source: U.S. Census 2000. The Census Tracts and Block Groups that comprise the study area are: Census Tract 140100 Block Group 1, Census Tract 140200 Block Group 1, Census Tract 140300 Block Group 2, and Census Tract 140300 Block Group 3.



**Figure 6**  
**U.S. Census Block**  
**Groups in the Study Area**  
**New Haven Rail Yard EA/EIE**  
**New Haven, CT**  
**State Project # 301-0088**



The total population of the study area represents approximately 5.6 percent of the total population of the city of New Haven. The study area has a higher minority population (63.5 percent) than New Haven (56.3 percent), the SCRCOG Region (19.2 percent), New Haven County (20.7 percent), or the state as a whole (18.4 percent). The study area also has a higher percentage of persons living below the poverty level (31.9 percent) than New Haven (22.3 percent), the SCRCOG Region (9.4 percent), New Haven County (9.2 percent), or the state as a whole (7.6 percent). Based on these findings, the study area has a relatively high concentration of minority and low-income populations. People living close to the Proposed Action site reside primarily in the Church Street South Apartments, the Robert T. Wolfe Apartment Building, and a portion of the Hill neighborhood (particularly along Union Avenue, Hallock Street, Cedar Street, and Spring Street).

## **8.2 DIRECT AND INDIRECT IMPACTS ON ENVIRONMENTAL JUSTICE/TITLE VI**

Impacts to environmental justice populations are assessed based on anticipated changes to community cohesion, access to transportation options, access to community resources and institutions, safety, and economic opportunity and natural and historic resources.

### **No-Build Alternative**

The No-Build Alternative would be a continuance of existing conditions, such that there would be no direct or indirect effects to environmental justice populations.

### **Proposed Action**

The Proposed Action's effects on the concentrations of low-income populations and minority populations in the study area were evaluated to identify whether impacts would be disproportionate and adverse. The impacts from the Proposed Action include temporary construction period impacts (see Chapter 27, Construction Impacts) to air quality, traffic, public utilities and services, and temporary impacts from noise. Temporary construction impacts, such as increased noise from truck traffic and dust from construction, will be mitigated to the greatest extent possible. The Proposed Action is contained within the existing NHRV facility; therefore, there will be very little noticeable alteration to the existing landscape. On-site activity once the Proposed Action is constructed will essentially be similar to the activity that presently occurs on site.

There will be socio-economic benefits from the Proposed Action, as additional jobs will be created (see Chapter 9, Socio-Economics).

The proposed improvements will effectively provide improved rail and increased transportation choices via the ability to store, service, and maintain the new M-8 rail cars in the NHRV. The net direct impacts would be positive for rail passengers, and neutral for those who do not utilize the railroad.

Compliance with Executive Order 12898 calls for particular efforts to reach out to environmental justice populations during the environmental assessment public involvement process. Public outreach specifically targeted to minority and low-income individuals included:

- Municipal stakeholder meetings January 5, 2007, and May 16, 2008
- Attendance of CTDOT representatives at the monthly meeting of the Hill South Development Team on March 23, 2007
- A public hearing was held in the Proposed Action area June 25, 2008, at Gateway Community College. Legal notices and display ads were published in the New Haven Register on May 20, June 10, and June 20, 2008 and in LaVoz, an Hispanic news publication, on May 29 and June 19, 2008.
- Display plans and the environmental document were made available for public inspection at the New Haven City Clerk's Office, the New Haven Free Public Library, the South Central Region Council of Governments office, the Connecticut State Library and at CTDOT's offices.

### **8.3 MITIGATION**

Based on the foregoing discussion, although the area includes environmental justice populations, the Proposed Action would not result in any adverse effects; therefore, no mitigation is proposed.

Temporary construction impacts, as well as mitigation measures, are discussed in Chapter 27 of this document.

### **8.4 SUMMARY OF IMPACTS**

The Proposed Action will not have any adverse impacts to low-income or minority Environmental Justice populations.

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## 9 SOCIO-ECONOMICS

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### 9.1 EXISTING SETTING

Until very recently, the socio-economic conditions have been relatively stable in the Proposed Action area (the Long Wharf area). Economic development projects in the Long Wharf area (such as opening of IKEA home furnishings store) have created jobs, but have been counter-balanced by the closure of other businesses, such as Pirelli Tire. Recent development plans, such as the relocation of Gateway Community College and Long Wharf Theater moves jobs and economic activity from Long Wharf to Downtown New Haven, but still within the overall Proposed Action area. Future projects, such as the proposed new “ring road” around the Long Wharf area to provide better traffic circulation, may bring positive changes to this once stable area.

The NHRY currently employs 662 people. Projected employment is 1,611 employees by 2015 and 1,632 by 2030. This increase in jobs from the Proposed Action is beneficial to the Long Wharf/Downtown New Haven area.

Socio-economic conditions are characterized by demographic makeup, and by state of the local economy, housing, employment, and income levels. Factors that define socio-economic and demographic conditions include resident population, household characteristics, and race. Information on socio-economic conditions in the study area were obtained from the U.S. Census Bureau (Census) 2000, the Connecticut Economic Resource Center, and the City of New Haven.

#### Demographics, Housing, and Income

New Haven has a total population of 123,626 (U.S. Census 2000). The regional population, defined by the South Central Region planning area, is approximately 546,800. While the South Central Region’s population has continued to increase since the 1960s, New Haven has been experiencing a decline in population since its peak in the 1950’s.

Table 6 shows U.S. Census data for the study area and surrounding areas. As described in Chapter 8, Environmental Justice, the study area has both a higher minority and low-income percentage than New Haven, the SCRCOG Region, New Haven County, or Connecticut.

**Table 6: Comparison of Socio-Economic Characteristics**

	Study Area	New Haven	SCRCOG Region	New Haven County	Connecticut
<b>Population</b>					
Population	6,890	123,626	546,799	824,008	3,405,565
Males	3,188	59,097	261,692	395,879	1,648,523
Females	3,702	64,529	285,107	428,129	1,757,042
Median Age	26.4***	29.3	39.2***	37.0	37.4
65+ Years	660	12,754	78,383	119,134	469,287
Percent 65+ Years	9.58%	10.20%	14.33%	14.46%	13.78%
White	2,517	54,080	441,754	653,714	2,777,794
Minority****	4,373	69,546	105,045	170,294	627,771
Percent Minority	63.47%	56.26%	19.21%	20.67%	18.43%
<b>Income/Poverty</b>					
Median Household Income (1999)	\$27,700**	\$29,604	\$62,859**	\$48,834	\$53,935
	2,195	27,613	51,203	75,733	259,514
Below Poverty*					
Percent Below Poverty	31.86%	22.34%	9.36%	9.19%	7.62%
<b>Housing/Households</b>					
Total Households	2,863	47,094	212,894	319,040	1,301,670
Average Household Size	2.68	2.40	2.57	2.50	2.53
Housing Units	3,161	52,941	227,660	340,732	1,385,975
Occupied Housing Units	2,863	47,094	212,894	319,040	1,301,670
Vacant Units	298	5,847	14,766	21,692	84,305
Percent Vacant	9.43%	11.04%	6.49%	6.37%	6.08%
Owner Occupied	366	13,918	132,666	201,349	869,742
Percent Owner Occupied	11.58%	26.29%	58.27%	59.09%	62.75%
Renter Occupied	2,497	33,176	80,228	117,691	431,928
Percent Renter Occupied	78.99%	62.67%	35.24%	34.54%	31.16%

\*Poverty is defined by the Census as \$8,500 per capita annually or less

\*\*Median Household Income derived by averaging multiple sources.

\*\*\*Median Age derived by averaging multiple sources.

\*\*\*\*Minority includes all non-Caucasians, including: American Indian, Eskimo, and Aleut Persons; Asian and Pacific Islander Persons; Black Persons; and all persons of Hispanic origin. The largest minority category included in the study area is Black or African American.

Source: U.S. Census 2000. The Census Tracts and Block Groups that comprise the study area are: Census Tract 140100 Block Group 1, Census Tract 140200 Block Group 1, Census Tract 140300 Block Group 2, and Census Tract 140300 Block Group 3.

New Haven provides the South Central Region with its greatest inventory of affordable housing. The percentage of those owning the home in which they reside is lower in the study area (11.9 percent), than in New Haven as a whole (26.3 percent), and much lower than the SCRCOG Region (58.3 percent), New Haven County (59.1 percent), or Connecticut (62.8 percent). The vacancy rate in the study area (9.4 percent) and New Haven (11 percent) is higher than the region, the county, or the state (all slightly over 6 percent).

## Employment and Economy

The key elements of the economy considered for this evaluation include jobs, employers, and economic trends. Table 7 provides an economic profile of New Haven, the central city and regional core of South Central Connecticut. New Haven, like other cities in the Northeast, is moving away from its manufacturing base and toward a more diversified economy. Biotechnology, as well as the food and allied products sector, are areas in manufacturing where New Haven continues to grow. However, services (55.9 percent) and trade (21.7 percent) are the most important sectors in New Haven. Educational services are a core element in the region's economy. The top five major employers in New Haven are Yale University, Yale-New Haven Hospital, The Hospital of Saint Raphael, Southern New England Telephone (SNET), and Southern Connecticut State University. As the central city, New Haven provides retail, arts and entertainment, and many services for the region.

**Table 7: Economic Profile of New Haven**

Jobs	68,211
Employers	5,352
<u>Businesses By Sector</u>	
Agriculture	0.6%
Construction/Mining	4.9%
Manufacturing	2.9%
Transportation And Utilities	2.9%
Trade	21.7%
Finance, Insurance, and Real Estate	7.1%
Services	55.9%
Government	4.0%

Source: Connecticut Economic Resource Center, Town Profile (2006)

As shown in Table 8, the study area represents 4.6 percent of New Haven's contribution to the regional workforce. New Haven represents 20.2 percent of the region's workforce. The unemployment rate in the study area and New Haven is between 8 and 9 percent, while the regional, county, and state unemployment rate is between 3 and 4 percent. A higher unemployment rate for an urban regional core, such as New Haven, which provides a myriad of services, is not uncommon. Of the approximately 7,900 unemployed in New Haven, 450 (or 5.6 percent) reside within the study area.

**Table 8: Summary of Employment and Unemployment Data**

<b>Employment</b>	<b>Study Area</b>	<b>New Haven</b>	<b>SCRCOG Region</b>	<b>New Haven County</b>	<b>Connecticut</b>
Labor Force	2,642	57,314	283,548	421,514	1,765,319
Of Employment Age	5,161	95,568	429,996	643,641	2,652,316
Armed Forces	21	49	238	324	8,211
Employed	2,171	49,358	266,097	396,326	1,664,440
Unemployed	450	7,907	17,213	24,864	92,668
Percent Unemployed	8.72%	8.27%	4.00%	3.86%	3.49%
Not In Labor Force	2,519	38,254	146,448	222,127	886,997

Source: U.S. Census 2000

## **9.2 DIRECT AND INDIRECT IMPACT ON SOCIO-ECONOMICS**

### **No-Build Alternative**

The No-Build Alternative would be a continuance of existing conditions, such that no direct or indirect impacts to socio-economic conditions would occur.

### **Proposed Action**

As noted in Chapter 8, Environmental Justice, the Proposed Action is not expected to have any adverse impacts on the resident population in the vicinity of the site. The number of jobs generated directly by the improved New Haven Rail Maintenance Facility is projected to increase from 662 people currently employed to 1,611 employees by 2015 and 1,632 by 2030. With the addition of jobs in the area, there may be a small benefit to local businesses and restaurants as people patronize stores and restaurants near their place of work. The impact of the Proposed Action to direct job creation will be beneficial.

## **9.3 MITIGATION**

Based on the foregoing discussion, the Proposed Action will not result in any adverse effects on socio-economic conditions. The impact instead would be somewhat beneficial. Therefore, no mitigation is proposed.

## **9.4 SUMMARY OF IMPACTS**

The Proposed Action will not result in any adverse Socio-economic impacts, but rather beneficial impacts.

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## 10 COMMUNITY DISRUPTION

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### 10.1 EXISTING SETTING

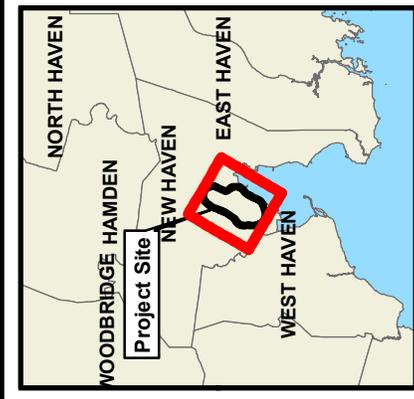
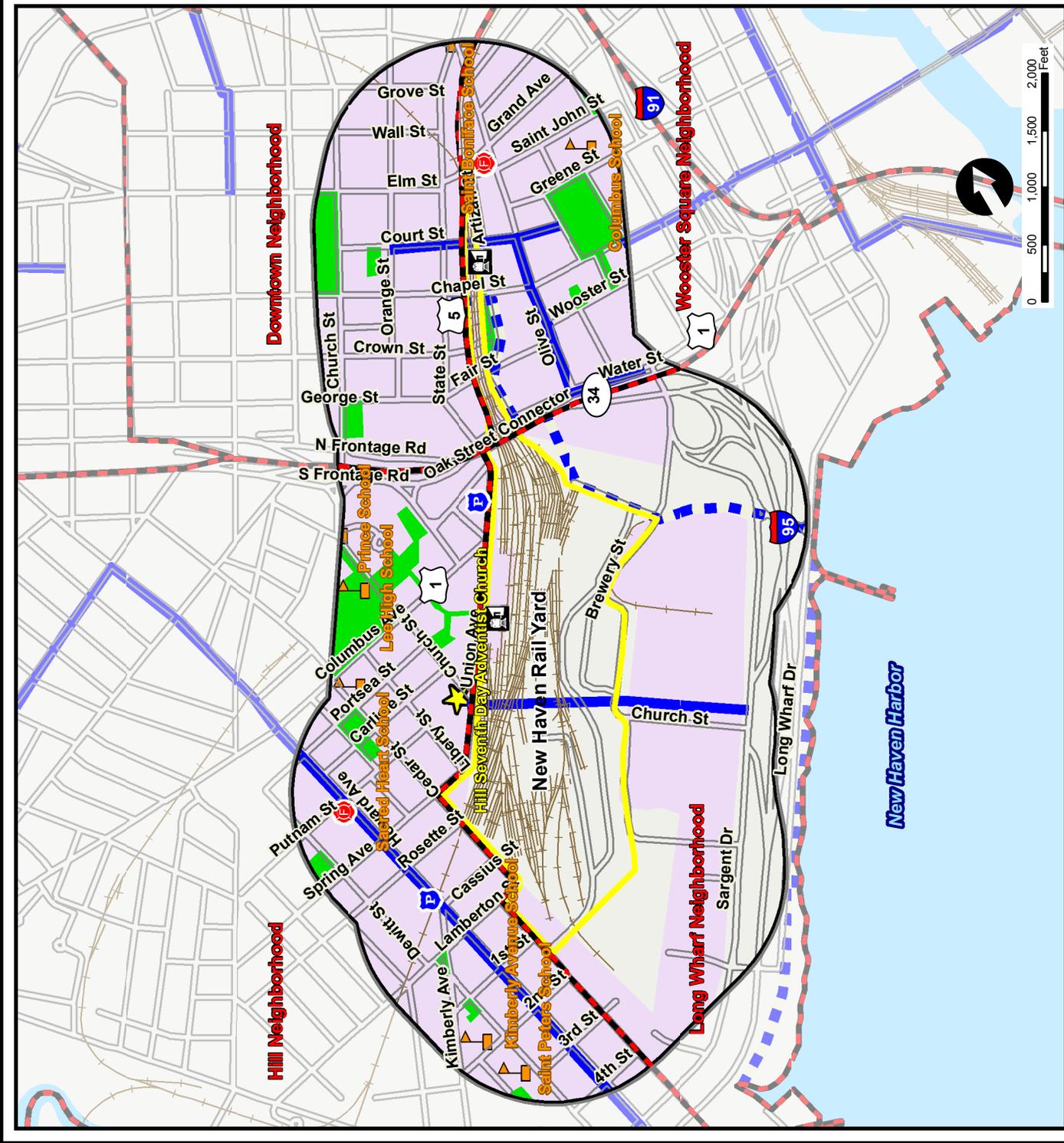
Community cohesion is the sense of unification, “belonging,” or closeness of a neighborhood or community. Community cohesion can be defined both in terms of physical characteristics of neighborhoods and through the less tangible perceptions of residents about their neighborhood quality of life. Physical characteristics important to neighborhood cohesion include access within the neighborhood, common historical and/or architectural themes among buildings, and the presence of community resources such as libraries, churches, and fire stations. Access within a neighborhood is characterized by the ability to travel by a variety of modes, including walking and bicycling. Disruption of community cohesion sometimes alters the quality of life for residents, through, for example, changes in spatial layout and/or travel routes. Community cohesion is often evaluated by looking at impacts on a neighborhood level. Information on neighborhoods in New Haven was obtained from the City of New Haven, City Plan Department.

According to the City Plan Department, there are several neighborhoods or planning areas within the vicinity of the Proposed Action (see Figure 7, Community Resources). The Proposed Action will occur largely in the Long Wharf section of the city. The Hill neighborhood borders the Proposed Action site on the west. Some of the proposed railroad track improvements extend north of Route 34, where the railroad tracks serve as a boundary between Downtown New Haven and the Wooster Square neighborhood.

The Long Wharf area is a loosely cohesive community, characterized by industrial and commercial activity, as well as governmental and institutional uses. The Harborside Trail and park adjacent to New Haven Harbor is a focal point and is used by those who live, work, study, or visit the area.

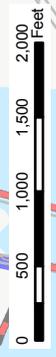
Directly west of the Proposed Action site and extending to West River is the Hill neighborhood. This older, lower-income, distressed neighborhood is characterized by vacancy rates and foreclosure activity higher than in New Haven as a whole. There are also some commercial and institutional uses in the area.

The Wooster Square neighborhood, located northeast of Route 34 and the railroad tracks, is a cohesive and well established neighborhood, rich with cultural activities and small businesses. Wooster Square was established as a historic district in 1970, and property values in this neighborhood are higher than the median for New Haven. The Wooster Square neighborhood is pleasantly streetscaped and contains one large and two smaller parks. Wooster Street restaurants provide focal points for this community.



- Rail Stations
- Fire Stations
- Police Station
- Religious Institutions
- Schools
- Roads
- Rail
- Vision Trail
- Bicycle Routes
- Planning Neighborhoods
- Municipal Properties
- Sewer Service Area
- Open Water
- Rail Yard Property
- Study Area

**Figure 7**  
**Community Resources**  
 New Haven Rail Yard EA/EIE  
 New Haven, CT  
 State Project # 301-0088



The Downtown neighborhood, located northwest of Route 34 and the railroad tracks, contains the central business district (CBD) and Ninth Square. The Ninth Square is a revitalized neighborhood, with a mix of residential, commercial, and industrial uses. Although not as established or cohesive as the Wooster Square neighborhood, the Ninth Square is developing a “sense of place,” as a residential and entertainment center.

## **10.2 DIRECT AND INDIRECT IMPACTS ON COMMUNITY**

### **No-Build Alternative**

The No-Build Alternative would be a continuance of existing neighborhood conditions, such that no direct or indirect impacts on community cohesion or neighborhoods would occur.

### **Proposed Action**

The Proposed Action would not result in any residential displacements, alter any neighborhood institutions or cultural resources, or inhibit access within neighborhoods and would not create any visual or physical barriers.

There will be temporary construction period impacts (see Chapter 27, Construction Impacts) to air quality, traffic, public utilities and services, and temporary impacts from noise. Temporary construction impacts, such as increased noise from truck traffic and dust from construction, will be mitigated to the greatest extent possible. The Proposed Action is contained within the existing NHRY facility; therefore, there will be very little noticeable alteration to the existing landscape. On-site activity once the Proposed Action is constructed will essentially be similar to the activity that presently occurs on site.

The proposed improvements will also effectively provide improved rail and increased transportation choices via the ability to store, service, and maintain the new M-8 rail cars in the NHRY. The net direct impacts would be positive for rail passengers, and neutral for those who do not utilize the railroad.

## **10.3 MITIGATION**

Based on the foregoing discussion, the Proposed Action will not result in any direct adverse effects on community cohesion or neighborhoods. Therefore, no mitigation is proposed. Mitigation for temporary construction period impacts is proposed and discussed in Chapter 27 of this EA.

## **10.4 SUMMARY OF IMPACTS**

The Proposed Action will not result in any adverse impacts to Community or Neighborhoods.



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## 11 TRAFFIC, TRANSIT, AND PARKING

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### 11.1 EXISTING SETTING

#### Roadway Network

The study area is located in the southern section of the city of New Haven, Connecticut near the I-95/I-91/Route 34 interchange. The project area is bounded by Route 34 to the north, I-95 to the east and southeast, Cedar Street and Hallock Avenue to the west, and Union Avenue along its northwest edge.

The study area includes the vicinity surrounding Route 34 Eastbound Exit 1 located at the eastern end of Route 34. Route 34 is a limited-access highway providing connection from I-95 and I-91 to Downtown New Haven.

The I-95 southbound interchanges 46 and 47 are within the study area. Interchange 46 is a full interchange providing access from I-95 to Sargent Drive. Sargent Drive is a minor arterial which runs along the southeast border of the study area. Interchange 47 provides access to I-95 southbound for travelers on Route 34 and Sargent Drive.

Twelve intersections in the study area were analyzed for traffic levels-of-service (LOS) and operational considerations. Figure 8 shows the study area existing road network.

The twelve intersections studied were reviewed and approved by CTDOT and include the following:

#### *Signalized Intersections*

1. Water Street at Brewery Street
2. Sargent Drive at Brewery Street/Route 34 EB off-ramp
3. Sargent Drive at Canal Dock Road/IKEA Drive
4. Sargent Drive at I-95 SB Interchange 46 off-ramp/Food Terminal Drive
5. Sargent Drive at Church Street Extension
6. Sargent Drive at I-95 SB Interchange 46 on-ramp
7. Sargent Drive at Long Wharf Drive
8. North Frontage Road/Water Street at State Street Northbound/Union Avenue
9. North Frontage Road/Water Street at State Street Southbound/Union Avenue
10. Union Avenue at Church Street South/Church Street Extension



**Figure 8**  
**Roadway Network & Study Area Intersections**  
 New Haven Rail Yard EA/EIE  
 New Haven, CT  
 State Project # 301-0088

Study Area Intersections  
 Rail Yard Property





### *Unsignalized Intersections*

11. Sargent Drive at I-95 SB Interchange 47 on-ramp
12. Sargent Drive at Brewery Street at Long Wharf Street

### Access

There are two access points to NHRY. The primary access is located at the end of Long Wharf Street. Long Wharf Street is a local road which is accessed via Brewery Street and also provides access to a U.S Post Office located at the corner of Long Wharf Street and Brewery Street. The secondary access is located off Hallock Avenue at the southwest end of the study area. The proposed improvements will relocate the existing Long Wharf Street access somewhat to the east off of Brewery Street.

### Transit Facilities

Transit services that exist in the greater New Haven area include local and express route transit service and commuter and regional rail services. Local and express transit services are provided by CT Transit, a state-owned provider. Table 9 summarizes the major bus lines in the project area. The Greater New Haven Transit District provides Dial-a-Ride and ADA service Monday through Saturday.

The Union Transit Station is located on Union Street which provides regional rail and bus service. There are approximately 110 passenger trains throughout the course of a day. Shore Line East provides commuter rail service between New Haven and New London with stops at nine stations en route. Commuter rail service is provided by MNR from Union Station to Grand Central Terminal in New York City. Amtrak provides regional service for the northeast corridor and service to major cities such as Boston, New York, Philadelphia, Washington, D.C., and Newport News. Greyhound and Peter Pan offer bus service from Union Station to major cities along the northeast corridor. Local transit and shuttle connections are available between Union Station and Downtown New Haven.

**Table 9: CT Transit Bus Service Summary within Project Area**

<b>Bus Line</b>	<b>Description of Service</b>	<b>Schedule</b>
Commuter Connection Downtown line	Service between Union Station and various locations Downtown	Buses depart every 30 minutes from 6:00-8:00 AM and arrive every 30 minutes from 3:30-8:30 PM.
Commuter Connection Sargent Drive	Service between Union Station and Gateway Community College	Buses depart Union Station every 30 minutes from 6:30-8:00 AM and arrive at Union Station every 30 minutes from 3:30-8:30 PM.
Whitney Avenue Bus Line	Service between Union Station and various locations in Downtown New Haven and locations in Hamden and Waterbury	Buses arrive and depart Union Station about every half-hour from 6:00 AM to 9:00 PM every weekday. Service is also provided from 7:30 AM to 8:00 PM on weekends.
Geoffe Street/Sargent Drive Bus Line	Service between Gateway Community College and various locations in Downtown New Haven and locations west of Downtown including West Hills	Buses arrive and depart Union Station about every half-hour from 6:00 AM to 10:00 PM every weekday. Service is also provided from 7:00 AM to 6:00 PM on Saturdays.

Source: Fitzgerald & Halliday, Inc., 2007.

Traffic Volumes

Daily traffic counts were conducted in the study area in October 2006. Daily roadway volume ranged from 6,000 vehicles per day to 18,600 vehicles per day on study area roadways. Table 10 summarizes the daily traffic volume on various study area roadways (2006).

**Table 10: Daily Traffic Volume (2006)**

<b>Roadway</b>	<b>Description</b>	<b>Daily Volume (total of both directions)</b>
Water Street	West of Brewery Street	9,000
Brewery Street	South of Water Street	11,600
Sargent Drive	South of Canal Dock Road	11,000
Church Street	West of Sargent Drive	6,000
Union Avenue	South of North Frontage Road	18,600

Source: Fitzgerald & Halliday, Inc., 2007.

Morning and afternoon peak hour traffic volumes for the project area were provided by CTDOT. The data provided included traffic volumes for the following conditions: 2006 Existing, Design Year 2015 No-Build and Proposed Action, and Design Year 2030 No-Build and Proposed Action. Schematic diagrams for the intersection peak hourly volumes are provided in Appendix E.

## Trip Generation

The number of vehicle trips into and out of the NHRY under existing conditions was quantified in order to analyze existing traffic conditions and establish an accurate trip generation rate that could be applied when estimating future traffic volumes. Existing trip generation at the facility was quantified based on the actual vehicle trip rate observed in the current facility. This entails a summation of all vehicles entering and exiting the facility at all possible access points. Vehicles entering and exiting the existing facility at both access points, Hallock Street and Long Wharf Street, during typical peak hour conditions were collected in October 2006. The total number of trips associated with the facility in each peak hour was then divided by the current employment level to yield the existing trip generation rate (peak hour trips per employee). It should be noted that this methodology accounts for only vehicular trips. It is assumed that the arrival mode of employees will be the same proportionally under future conditions. Therefore, no adjustment was made for existing transit and walk trips by employees.

Table 11 shows the observed traffic volumes in vehicles per hour (vph) and the resulting calculated trip generation rates for the morning (AM) and evening (PM) peak hours, based on the total employees (662) of the NHRY. The 662 employees work over the course of three shifts (7AM - 4PM, 4PM - 12 midnight, 12 midnight – 7AM) throughout the day. As shown, there are 197 vph during the morning peak hour and 71 vph during the afternoon peak hour.

**Table 11: Existing Condition (2006): Peak Hour Generated Volume and Calculated Trip Rate**

	AM Peak Hour			PM Peak Hour		
	Entering (vph)	Exiting (vph)	Total (vph)	Entering (vph)	Exiting (vph)	Total (vph)
Long Wharf Street Entrance	59	56	115	10	46	56
Hallock Avenue Entrance	49	33	82	5	10	15
Total Trips	108	89	197	15	56	71
Existing Trip Generation Rate (trips/employee)	0.16	0.13	0.30	0.02	0.08	0.11

Source: Fitzgerald & Halliday, Inc., 2007.  
 (vph) vehicles per hour  
 2006 Employment = 662 employees

Applying these trip generation rates, peak hour site-generated traffic volumes for future conditions were estimated, as shown in Table 12. The traffic estimates were based on future projected employment levels at the NHRY: 1,611 employees by year 2015 and 1,632 employees by the full build out of the proposed project in year 2030. It is anticipated that the schedule of employment shifts will be similar to the baseline (existing) condition. These future employment levels result in higher future site-generated traffic volumes: approximately 467 vph in the AM

peak hour and 161 vph in the PM peak hour during design year 2015, and 473 vehicles per hour (vph) in the AM peak hour and 164 vph in the PM peak hour for design year 2030.

**Table 12: Peak Hour Generated Traffic: Existing Year 2006, Design Year 2015, and Design Year 2030**

<b>Peak Hour Generated Volumes (vph)</b>					
	<b>Existing Year 2006</b>	<b>Design Year 2015</b>	<b>Net Increase 2015</b>	<b>Design Year 2030</b>	<b>Net Increase 2030</b>
<b>AM Peak Hour</b>					
Entering (vph)	108	258	150	261	153
Exiting (vph)	89	209	120	212	123
Total (vph)	197	467	270	473	276
<b>PM Peak Hour</b>					
Entering (vph)	15	32	17	33	18
Exiting (vph)	56	129	73	131	75
Total (vph)	71	161	90	164	93

Source: Fitzgerald & Halliday, Inc., 2007.

(vph) vehicles per hour

Trip generation rates used for Design Years 2015 and 2030 are shown in Table 11

Projected employment is 1,611 in Design Year 2015 and 1,632 in Design Year 2030.

### Trip Distribution

To determine the route patterns to the NHRY that are taken by the Proposed Action's site generated trips, an arrival/departure trip distribution pattern was developed for traffic expected to be generated by the project. Trip distribution was derived from review of Census 2000 journey to work data for commuters working in the city of New Haven. Trips were distributed to the surrounding roadway network based on the most direct route to and from the site. Trips were then assigned to the two site driveways based on a review of the current operations as well as proximity to the surrounding roadways. It was assumed that a portion (20 percent) of the employees using I-95 northbound and southbound would use the Hallock Street access. This yielded an assignment of 21 percent of the employees to the Hallock Street access and 79 percent of the employees to the Brewery Street access. The site-generated trip distribution and assignment is applied to the estimated future site-generated trips based on future employment and is used for the impact analysis. The trip distribution is summarized in Table 13.

**Table 13: Site Traffic Distribution and Assignment**

Route to Site	Percent of Distribution	Site Access Assignment	
		Long Wharf Street	Hallock Street
I-91 South to I-95 South	33%	26%	7%
Shore Line East to I-95 South	20%	16%	4%
Local Roads to I-95 South	25%	20%	5%
I-95 North	10%	8%	2%
Route 34 Eastbound	9%	9%	0%
Local Roads East	3%	0%	3%
	<b>100%</b>	<b>79%</b>	<b>21%</b>

Source: Fitzgerald & Halliday, Inc., 2007.

Figures depicting the trip distribution and site-generated trips used for the impact analysis are provided in Appendix E.

Safety Evaluation

Crash data were obtained from CTDOT for Route 1 over a three-year period (2003-2005). A total of 204 crashes were recorded along Route 1 in the study area over the three year period. A review of the crash data indicates that the highest number of accidents (28) occurred at the intersection of Union Avenue/State Street southbound with North Frontage Road. Twenty-nine percent of the accidents at this location were angle collisions indicating that motorists are likely violating traffic controls. Eighteen percent of the accidents at this location were rear-end collisions, indicating that drivers may be following too closely; another eighteen percent of the accidents were sideswipes in the same direction indicating that motorists may be trying to bypass vehicles into another lane.

Crash data were also obtained for the I-95 southbound Interchange 46 on- and off-ramps for a three-year period (2003-2005). A total of 28 collisions were recorded at these two locations. The highest number of accidents (21) occurred on the off-ramp. Forty-three percent of the accidents on the off-ramp were rear-end collisions, indicating that drivers are likely following too closely. No other patterns of significance were noted. A summary of the accident data is provided in the Appendix E. Crash data on the local roadways was not available.

Parking

Currently, there are almost 400 surface parking spaces within the rail yard for railroad workers. No parking structure is currently on site.

## 11.2 DIRECT AND INDIRECT IMPACTS ON TRAFFIC, TRANSIT, AND PARKING

### Traffic Operations Analysis

In order to assess the traffic impacts associated with the expansion of the NHRY, a capacity analysis was conducted for the study intersections using procedures presented in the *Highway Capacity Manual 2000*, *Transportation Research Board*. Synchro 6.0, a computer-based intersection operations model, which implements these procedures, was used to perform the analyses. Traffic control signal plans provided by the City of New Haven in the study area were incorporated into the analysis. The analyses were performed for the weekday AM and PM peak hours for the base year (2006), No-Build and Proposed Action for design years 2015 and 2030.

### Intersection Analysis

Level of Service (LOS) for an intersection is rated in a range from A to F, with A being the best operating conditions and LOS F being the most congested. LOS F represents long delays and generally unacceptable conditions. LOS designation is reported differently for signalized and unsignalized intersections. For signalized intersections, LOS is defined in terms of delay, which is a measure of driver discomfort and frustration, fuel consumption, and lost travel time. Specifically, LOS criteria are stated in terms of average stopped delay per vehicle for the peak 15-minute period of the peak hour for the entire intersection and by approach. Table 14 provides a summary of the LOS for the signalized study area intersections; Table 14 also summarizes the LOS at the unsignalized intersections.

#### *Base Year 2006- Existing Conditions*

According to the *CTDOT Design Manual*, (2001) the minimum acceptable intersection LOS is D. The analysis results describe the operational effectiveness of the study area intersections. Results from the LOS analysis for the study area intersections, as shown in Table 14, indicate that all turning movements at the unsignalized intersections operate at acceptable levels of service (LOS D or better). However, three signalized intersections operate at failing levels of service under existing conditions (less than LOS D) during the PM peak hour. These intersections include:

- *Sargent Drive at Long Wharf Drive (signalized)*: Operates at LOS F during the PM peak hour
- *North Frontage Road/Water Street & State Street Northbound/Union Avenue (signalized)*: Operates at LOS F during the PM peak hour
- *North Frontage Road/Water Street & State Street Southbound/Union Avenue (signalized)*: Operates at LOS F during the PM peak hour

**Table 14: Level-of-Service Summary: Existing Year 2006**

Intersection	Existing 2006 Intersection LOS	
	AM Peak Hour	PM Peak Hour
<b>Signalized Intersections</b>		
Water Street & Brewery Street	A	B
Sargent Drive & Brewery Street/Route 34 EB off-ramp	B	B
Sargent Drive & Canal Dock Road/IKEA Drive	B	C
Sargent Drive & I-95 SB Exit 46 off-ramp/Food Terminal Drive	D	C
Sargent Drive & Church Street Extension	A	B
Sargent Drive & I-95 SB Exit 46 On-ramp	A	D
Sargent Drive & Long Wharf Drive	B	F
North Frontage Road/Water Street & State Street NB/Union Avenue	C	F
North Frontage Road/Water Street & State Street SB/Union Avenue	A	F
Union Avenue & Church Street South/Church Street Extension	B	C
<b>Unsignalized Intersections</b>		
Sargent Drive at I-95 southbound on-ramp (eastbound left)	A	A
Brewery Street/Ring Road at Long Wharf Street (eastbound left)	A	A
(southbound left)	A	A

Source: Fitzgerald & Halliday, Inc., 2007.

*Design Year 2015- No-Build*

CTDOT is proposing reconstruction and the reconfiguring of I-95 through the Long Wharf area of New Haven by 2015. The transportation improvements are a part of the I-95 New Haven Harbor Crossing Corridor Improvement Program, a multi-phased transportation improvement program consisting of roadway improvements along 7.2 miles of I-95 between Interchange 46 (Sargent Drive) and Interchange 54 (Cedar Street) in Branford. The project also includes the reconstruction of the Pearl Harbor Memorial Bridge.

During the design year 2015, it is anticipated that I-95 will remain a six thru-lane facility. However, a nominal amount of widening will be provided between the Canal Dock Road Overpass and the Howard Avenue Overpass to provide lane transitions between the new I-95/I-91/Route 34 interchange and existing conditions. As part of the reconstruction of the I-95/I-

91/Route 34 Interchange (State Project No. 92-534, also known as Contract E of the New Haven Harbor Crossing Program), existing on- and off-ramps to and from Sargent Drive and Long Wharf Drive will be relocated southerly to provide the proper lane transitions. The reconstruction will create new intersection configurations on Sargent Drive for the on- and off-ramps and the new I-95 Exit 46 southbound on-ramp will be changed from an unsignalized intersection to a signalized intersection. The ramp relocations, between Church Street extension and the New Haven Register Building, are necessary to accommodate the widening of I-95 in Contract E. A schematic diagram depicting the roadway configuration along Sargent Drive is provided in Appendix E.

Under the 2015 No-Build condition, three intersections are expected to operate at LOS E or LOS F during the AM or PM peak hour. These intersections include:

- *Sargent Drive at I-95 Southbound on-ramp (signalized)*: Operates at LOS E during the PM peak hour
- *North Frontage Road/Water Street & State Street Northbound/Union Avenue (signalized)*: Operates at LOS F during the PM peak hour (same as existing)
- *North Frontage Road/Water Street & State Street Southbound/Union Avenue (signalized)*: Operates at LOS F during the PM peak hour (same as existing)

#### *Design Year 2015- Proposed Action*

The Proposed Action will generate an additional 270 trips in the morning peak hour and 90 trips in the afternoon peak hour. Results from the LOS analysis for the 2015 Proposed Action (compared to the 2015 No-Build), are shown in Table 15 and indicate that traffic operations are anticipated to be similar to the No-Build condition and that no significant traffic impact is expected as a result of the proposed project. The intersection of Sargent Drive at I-95 Southbound on-ramp will experience some increase in delay from project traffic resulting in the decline of operations from a LOS E to LOS F during the PM peak hour. However, the roadway system anticipated in the design year 2015 in the vicinity of the NHRY appears to have an adequate carrying capacity to accommodate the additional traffic without significant increases in delay and congestion (compared to the 2015 No-Build). Therefore, no off-site traffic mitigation is warranted as part of the Proposed Action.

**Table 15: Level-of-Service Summary: Design Year 2015 No-Build and Proposed Action**

	No-Build 2015 Intersection LOS		Proposed Action 2015 Intersection LOS	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
<b>Signalized Intersections</b>				
Water Street & Brewery Street	A	B	A	B
Sargent Drive & Brewery Street/Route 34 EB off-ramp	A	B	A	B
Sargent Drive & Canal Dock Road/IKEA Drive	B	C	B	C
Sargent Drive & Church Street Extension	A	C	A	C
Sargent Drive & I-95 SB Off-ramp ( <i>new</i> )	B	B	B	B
Sargent Drive & I-95 SB On-ramp ( <i>new</i> )	B	E	B	F
Sargent Drive & Long Wharf Drive	B	B	B	B
North Frontage Road/Water Street & State Street NB/Union Avenue	C	F	D	F
North Frontage Road/Water Street & State Street SB/Union Avenue	A	F	A	F
Union Avenue & Church Street South/Church Street Extension	B	C	B	C
<b>Unsignalized Intersections</b>				
Brewery Street/Ring Road at Long Wharf Street (eastbound left)	A	A	A	A
(southbound left)	A	A	B	B

Source: Fitzgerald & Halliday, Inc., 2007.

*Design Year 2030- No-Build*

Ongoing transportation improvement projects as part of the New Haven Harbor Crossing Program are anticipated to consist of the removal of the southern half of Long Wharf Drive by 2030. The northern half would be reduced in width and truncated in a cul-de-sac to expand Long Wharf Park, as proposed in the New Haven City’s Park redevelopments plans. However, because Long Wharf Drive would be closed to through traffic, traffic on Sargent Drive is expected to increase. Therefore, a new secondary roadway is planned on an alignment identified by the City to relieve some of the redirected traffic. Referred to as the “ring road”, this secondary roadway is located parallel to and west of Sargent Drive and would connect to Brewery Street and travel along the NHRY property line and behind several businesses with frontage on Sargent Drive. The “ring road” construction will remove the on- and off-ramps at Sargent Drive constructed as

part of the I-95/I-91/Route 34 Interchange Reconstruction Project and will create a new unsignalized intersection for the I-95 southbound off-ramp. Access to the I-95 southbound on-ramp will be provided via the intersection of Sargent Drive with Long Wharf Drive.

I-95 will be widened and maintained generally at its current grade throughout the project area. The I-95 bridge over Long Wharf Extension will be reconstructed to accommodate the widened roadway. The proposed pedestrian bridge over I-95 opposite Church Street South Extension will also be constructed and will provide a connection between Downtown New Haven and the waterfront parkland. The existing portal at Canal Dock Road will continue to provide vehicular and pedestrian access to the park. However, Long Wharf Extension portal will not provide vehicular or pedestrian access to Long Wharf Park. A schematic diagram depicting the roadway configuration along Sargent Drive is provided in the Appendix E.

Under the 2030 No-Build condition, three intersections are expected to operate at LOS E or LOS F during the AM or PM peak hour. These intersections include:

- *Sargent Drive at Long Wharf Drive (signalized)*: Operates at LOS E during the AM peak hour and LOS F during the PM peak hour
- *North Frontage Road/Water Street & State Street Northbound/Union Avenue (signalized)*: Operates at LOS F during the PM peak hour
- *North Frontage Road/Water Street & State Street Southbound/Union Avenue (signalized)*: Operates at LOS F during the PM peak hour

In addition, two unsignalized intersections are expected to have turning movements that operate at LOS F during the AM and PM peak hours. These intersections are:

- *Sargent Drive at I-95 Southbound off-ramp (new)*: The southbound right-turn movement operates at LOS F during the AM and PM peak hours
- *Sargent Drive at Brewery Street*: The northbound right-turn movement operates at LOS F during the AM and PM peak hours

#### *Design Year 2030- Proposed Action*

Results from the LOS analysis for the 2030 Proposed Action (compared to the 2030 No-Build), are shown in Table 16 and indicate that no intersections are expected to decline to a failing LOS as a result of the Proposed Action. Traffic operations at all study area intersections will operate similar to the 2030 No-Build condition. Thus, operational inefficiencies in the study area do not result from the Proposed Action but are a result of traffic growth that naturally occurs over a period of time. The roadway system anticipated in design year 2030 in the vicinity of the NHRY appears to have an adequate carrying capacity to accommodate the additional traffic without significant increases in delay and congestion (compared to the 2030 No-Build). No off-site traffic mitigation is warranted as part of the Proposed Action.

Table 16: Level-of-Service Summary: Design Year 2030 No-Build and Proposed Action

	No-Build 2030 Intersection LOS		Proposed Action 2030 Intersection LOS	
	AM Peak Hour	PM Peak Hour	AM Peak Hour	PM Peak Hour
<b>Signalized Intersections</b>				
Water Street & Brewery Street	B	B	B	B
Sargent Drive & Canal Dock Road/IKEA Drive	C	C	C	C
Sargent Drive & Church Street Extension	A	C	B	C
Sargent Drive & Long Wharf Drive	F	E	F	E
North Frontage Road/Water Street & State Street NB/Union Avenue	D	F	D	F
North Frontage Road/Water Street & State Street SB/Union Avenue	B	F	B	F
Union Avenue & Church Street South/Church Street Extension	B	C	B	C
<b>Unsignalized Intersections</b>				
Sargent Drive at I-95 southbound off-ramp (new) (southbound right)	F	F	F	F
Sargent Drive at Brewery Street (northbound left)	F	F	F	F
Brewery Street/Ring Road at Long Wharf Street (eastbound left)	A	A	A	A
(southbound left)	B	B	C	B

Source: Fitzgerald & Halliday, Inc., 2007.

Note: The ongoing transportation improvement projects as part of the New Haven Harbor Crossing Program provide changes and additional roadway linkages in the study area such that a direct comparison of intersections between future design years 2015 and 2030 cannot be made. A schematic diagram depicting the roadway configuration along Sargent Drive is provided in the Appendix E.

### Parking

For the Proposed Action, approximately 700 parking spaces will be provided including existing spaces and new spaces. There will be 348 parking spaces provided in a new parking garage. The parking garage will be located on the southeast corner of the site to accommodate the number of rail employees that will need to access offices in that portion of the site. The remaining 352 spaces will be provided as surface parking in locations throughout the site. The Proposed Action results in an additional 400 parking spaces compared to the existing condition. The traffic associated with the additional parking spaces for the projected level of employment is accounted for in the traffic impact analysis.

## Summary

The transportation analysis conducted for this study evaluated the Existing, 2015 No-Build and Proposed Action, and 2030 No-Build and Proposed Action conditions. Key observations from the analysis include:

- Under the Existing condition, three signalized intersections currently operate at failing levels of service (LOS E or F) during the PM peak hour. All turning movements at the unsignalized intersections operate at acceptable (LOS D or better) conditions.
- Currently, the NHRV employs 662 employees. Projected employment is expected to be 1,611 employees by year 2015 and 1,632 employees by the full build out of the Proposed Action in year 2030.
- Current operations at the NHRV generate 197 vehicles per hour (vph) during the morning peak hour and 71 vph during the afternoon peak hour. Based on the current trip rates, approximately 467 vph are expected to be generated during the morning peak hour and 161 vph are expected in the PM peak hour during design year 2015. For design year 2030, 473 vph are expected during the morning peak hour and 163 vph in the afternoon peak.
- Under the 2015 Proposed Action, the project will add 270 vehicles during the morning peak hour and 90 vehicles during the afternoon peak hour to the surrounding roadways. Under the 2030 Proposed Action, the project will add 276 vehicles during the morning peak hour and 93 vehicles during the afternoon peak hour.
- CTDOT is proposing reconstruction and the reconfiguring of I-95 through the Long Wharf area of New Haven including significant changes in the study area. The transportation improvements are a part of the I-95 New Haven Harbor Crossing Corridor Improvement Program, a multi-phased transportation improvement program consisting of roadway improvements along 7.2 miles of I-95 between Interchange 46 (Sargent Drive) and Interchange 54 (Cedar Street) in Branford.

As part of this Corridor Improvement Program, a new secondary roadway will be provided on an alignment identified by the City, to relieve some of the redirected traffic resulting from changes to Long Wharf Drive. Referred to as the “ring road”, this secondary roadway is located parallel to and west of Sargent Drive and will connect to Brewery Street and travel along the southern and eastern NHRV property line and behind several businesses with frontage on Sargent Drive.

- Although the Proposed Action will generate additional trips during the 2015 and 2030 Proposed Action conditions, traffic operations are expected to be similar to the 2015 and 2030 No-Build conditions, respectively. Therefore, the roadway system in the vicinity of the NHRY is expected to have an adequate carrying capacity to accommodate the additional traffic without significant increases in delay and congestion (compared to the 2015 and 2030 No-Build conditions). Thus, no off-site traffic mitigation is warranted.

### **11.3 MITIGATION**

During the design year 2015 and 2030 conditions, traffic operations at study area intersections are expected to operate similar to the No-Build condition. Therefore, any operational inefficiencies in the study area do not result from the Proposed Action. No off-site traffic mitigation is warranted as part of the Proposed Action.

### **11.4 SUMMARY OF IMPACTS**

The Proposed Action will generate additional traffic during the morning and afternoon commute peak periods. However, it is anticipated that the future roadway network in design years 2015 and 2030 can accommodate the increased traffic generated by the Proposed Action without a significant increase in delay and congestion.

There are no adverse impacts on Traffic, Transit or Parking as a result of the Proposed Action. Rather, the ultimate goal of the Proposed Action is to create an improved rail yard, better equipped to service the public rail transportation system.



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## **12 CONSIDERATIONS RELATING TO PEDESTRIANS AND BICYCLISTS**

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### **12.1 EXISTING SETTING**

Based on information presented in the *Connecticut Bicycle Map* (CTDOT, 2002), Long Wharf Drive, which runs just outside the southeastern border of the study area, is designated as part of a cross-state bicycle route. In addition, Brewery Street is designated as part of the East Coast Greenway.

The Harborside Trail is a proposed facility (off-road paved path where possible) that will closely follow the New Haven shoreline from the West River to Lighthouse Point. The Farmington Canal Greenway Vision Trail will also connect the existing Farmington Canal Trail to the New Haven Harbor along abandoned canal /railroad right-of-way. Finally, most roadways in the study area feature sidewalks on one side, including North Frontage Road, Water Street, Brewery Street, Sargent Avenue, Church Street and Union Avenue.

### **12.2 DIRECT AND INDIRECT IMPACTS TO PEDESTRIANS AND BICYCLISTS**

The Proposed Action will have no impact on pedestrian and bicycle activity in the area. The existing sidewalks will remain in their present condition and configuration.

### **12.3 MITIGATION**

No adverse impacts are anticipated from the Proposed Action. Consequently, no mitigation is proposed.

### **12.4 SUMMARY OF IMPACTS**

No adverse impacts to Pedestrians and Bicyclists are anticipated from the Proposed Action.



## 13 AIR QUALITY

### 13.1 EXISTING SETTING

The Clean Air Act of 1970 and subsequent Clean Air Act Amendments established National Ambient Air Quality Standards (NAAQS) for six criteria pollutants to ensure the protection of human health and public welfare. NAAQS were established for carbon monoxide (CO), nitrogen dioxide (NO<sub>2</sub>), sulfur dioxide (SO<sub>2</sub>), lead (Pb), ozone, and particulate matter (PM). The Clean Air Act also required states to monitor air quality to determine if regions meet the NAAQS. If a region shows “exceedances” of any of the NAAQS, that part of the state is classified as non-attainment to that pollutant and the state must develop an air quality plan, called a State Implementation Plan (SIP), which will bring that area into compliance.

The US Environmental Protection Agency (EPA) Office of Air Quality Planning and Standards has set National Ambient Air Quality Standards for six principal pollutants, which are called "criteria" pollutants. They are listed below. Carbon monoxide (CO), one of the six pollutants regulated by the NAAQS, is the air quality parameter that could be most likely affected by traffic associated with the Proposed Action. Units of measure for the standards are parts per million (ppm) by volume, milligrams per cubic meter of air (mg/m<sup>3</sup>), and micrograms per cubic meter of air (µg/m<sup>3</sup>) (refer to Table 17).

**Table 17: National Ambient Air Quality Standards**

Pollutant	Primary Standards	Averaging Times	Secondary Standards
Carbon Monoxide	9 ppm (10 mg/m <sup>3</sup> )	8-hour <sup>1</sup>	None
	35 ppm (40 mg/m <sup>3</sup> )	1-hour <sup>1</sup>	None
Lead	1.5 µg/m <sup>3</sup>	Quarterly Average	Same as Primary
Nitrogen Dioxide	0.053 ppm (100 µg/m <sup>3</sup> )	Annual (Arithmetic Mean)	Same as Primary
Particulate Matter (PM <sub>10</sub> )	<i>Revoked</i> <sup>2</sup>	---	---
	150 µg/m <sup>3</sup>	24-hour <sup>1</sup>	
Particulate Matter (PM <sub>2.5</sub> )	15 µg/m <sup>3</sup>	Annual <sup>3</sup> (Arith. Mean)	Same as Primary
	35 µg/m <sup>3</sup>	24-hour <sup>4</sup>	
Ozone	0.075 ppm <sup>5</sup>	8-hour <sup>5</sup>	Same as Primary
	0.12 ppm	1-hour <sup>6</sup>	Same as Primary
Sulfur Oxides	0.03 ppm	Annual (Arith. Mean)	-----
	0.14 ppm	24-hour <sup>1</sup>	-----
	-----	3-hour <sup>1</sup>	0.5 ppm (1300 µg/m <sup>3</sup> )

<sup>1</sup> Not to be exceeded more than once per year.

<sup>2</sup> Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the agency revoked the annual PM<sub>10</sub> standard in 2006 (effective December 17, 2006).

<sup>3</sup> To attain this standard, the 3-year average of the annual arithmetic mean PM<sub>2.5</sub> concentrations from single or multiple community-oriented monitors must not exceed 15 µg/m<sup>3</sup>.

<sup>4</sup> To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed

35 µg/m<sup>3</sup>. (effective December 17, 2006).

<sup>5</sup> To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (effective May 27, 2008)

<sup>6</sup> (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is <= 1.

(b) The 1-hour NAAQS will no longer apply to an area one year after the effective date of the designation of that area for the 8-hour ozone NAAQS.

For transportation projects, the criteria pollutants of greatest concern are CO and ozone because they are predominantly influenced by motor vehicle activity. The NAAQS for CO are a 1-hour average concentration of 35 parts per million (ppm) and an 8-hour average concentration of 9 ppm. The NAAQS for ozone is a one-hour average of 0.12 ppm and an 8-hour average concentration of 0.075 ppm ( 0.08 ppm at the time of this study, in 2006).

To determine pollutant concentrations, an air quality monitoring system has been established to sample the ambient air and report the level of pollution over time. The reported levels are used to designate an area as attainment or non-attainment for each pollutant. In Connecticut, CO is monitored at four locations distributed throughout Hartford, Fairfield, and New Haven Counties, while ozone is monitored at 11 locations distributed throughout the entire state. There is one CO monitoring location in New Haven; located at 121 Elm Street. In 2005 this site had no exceedences of the primary 1-hour or the primary 8-hour standards. There are two ozone monitoring locations in New Haven County: one located at Hammonasset State Park, Madison, and one at James Street, New Haven. The Hammonasset monitor exceeded the 1-hour standard on three occasions and the 8-hour standard on eight occasions in 2005. The James Street monitor exceeded the 1-hour standard on one occasion and exceeded the 8-hour standard on three occasions in 2005. There are eight PM monitoring locations throughout New Haven County. None of these monitoring locations exceeded the standards in 2005. There are three SO<sub>2</sub> monitoring locations in New Haven County; located at James Street, State Street, and Meadow Street in Waterbury. None of these monitoring locations exceeded the standards in 2005. Data collected at the monitoring sites help establish background air quality levels.

According to the US Environmental Protection Agency's *2006 Annual Report on Air Quality in New England* (EPA, July 2007), the air quality attainment designations for the six criteria pollutants in the New Haven region were:

**CO:** The New Haven region, and entire state of Connecticut, is currently designated as attainment for CO.

**Ozone:** The entire state of Connecticut is designated as non-attainment for the 1-hour ozone standard. The New Haven region is classified as "serious non-attainment" for the 1-hour standard. The future attainment date is projected to be June 2010.

**PM:** EPA has established NAAQS for two size ranges of PM. The entire state of Connecticut is currently in attainment of PM<sub>10</sub> (particulate matter with a diameter of 10 microns or less). New Haven County is in non-attainment for PM<sub>2.5</sub> (particulate matter with a diameter of 2.5 microns or less).

**NO<sub>2</sub>:** The entire state of Connecticut is in attainment for NO<sub>2</sub>.

**Pb:** The entire state of Connecticut is in attainment for Pb.

**SO<sub>2</sub>:** The entire state of Connecticut is in attainment for SO<sub>2</sub>.

### Carbon Monoxide

CO is the most important transportation-related pollutant of concern at the local level. CO can potentially reach dangerous levels in local areas, such as city-street canyons with heavy auto traffic and little wind. CTDEP locates CO monitors throughout the state specifically to measure

CO levels from high traffic areas in populated locations. However, EPA's air quality summary demonstrates that CO concentrations are not problematic in New Haven County. Specifically:

- The highest recorded maximum 8-hour concentration in the county (1.9 ppm) is well below the NAAQS of 9 ppm.
- Trend graphs for the past 20 years show concentrations of CO well below NAAQS and indicate a downward trend in concentrations.

### Ozone

Ozone is a gas which, at high concentrations, irritates the mucous membranes of the respiratory system and can cause impaired lung function. Ozone is a highly reactive form of oxygen and the principal component of smog. It is not emitted into the air directly, but rather formed by chemical reactions in the air from two other pollutants, called "precursors" of ozone: volatile organic compounds (VOC) and nitrogen oxides (NOx). In addition to transportation sources, VOC and NOx are emitted from numerous sources such as pesticides, paints, and electrical utilities.

A large percentage of the peak ozone concentrations in Connecticut are caused by the transport of ozone and/or precursors from the New York City area and from other points west and south of Connecticut. EPA's air quality summary of ozone concentrations in New Haven County states:

- The highest 1-hour concentration in New Haven County recorded during 2005 was 0.149 ppm, and exceeded the NAAQS of 0.125 ppm on one day.
- The highest 8-hour concentration in New Haven County recorded during 2005 was 0.108 ppm and exceeded the NAAQS of 0.08 ppm on two days
- Although NAAQS exceedances correspond to changing summer weather conditions, overall trends are downward.

### Particulate Matter

New Haven County, as part of the New York City Metropolitan Area, is in non-attainment for PM<sub>2.5</sub>. Connecticut is required to submit a State Implementation Plan to EPA outlining measures to meet the standard by April 2010.

## 13.2 DIRECT AND INDIRECT IMPACTS ON AIR QUALITY

### Regional Impacts — Transportation Conformity

The impacts of a particular project on regional air quality are difficult to determine, particularly for small projects such as this one. The determination of regional air quality impacts requires a rigorous modeling exercise. These impacts are assessed when the Metropolitan Planning Organization (MPO) develops an air quality conformity determination of the region's long- and short-term transportation plans, which includes all existing and projected roads and transit system improvements. This process involves modeling travel demand across the entire regional transportation system and applying vehicle emissions to vehicle trips and vehicle miles of travel across this network. The conformity determination must demonstrate that the transportation plans will not contribute to exceedances of air quality standards.

The South Central Regional Council of Governments (SCRCOG), which is the MPO for the region, coordinates with the CTDOT to conduct a conformity determination of the region's transportation plan. The conformity analysis must demonstrate that emissions from the "action" scenarios are less than the amount allowed in the VOC, NO<sub>x</sub>, and CO emissions budgets established by the CTDEP for transportation sources. The emissions budgets are set at levels that will maintain the NAAQS for each pollutant. Therefore, transportation-related emissions must be less than or equal to these emissions budgets.

#### Project Level Conformity Determination

Federal regulations concerning the conformity of transportation projects developed, funded or approved by the USDOT and by metropolitan planning organizations (MPOs) are contained in 40 CFR 93. In accordance with 40 CFR 93.109, the applicable criteria and procedures for determining the conformity of a project which is from a conforming Transportation Plan are listed in 40 CFR 93.109(b). Each of these criteria has been determined to be satisfied for the Proposed Action, as follows:

- **Proposed Action from a Conformity Plan** – The Proposed Action is identified in the MPO's current Long Range Transportation Plan. The scope of this Proposed Action, as described in this environmental document, is consistent with the scope identified in the current Plan.
- **Currently Conforming Plan** – The MPO's current Long Range Transportation Plan was determined to be in conformity by FHWA and FTA. The Proposed Action is included in this Plan.
- **CO Hot Spots** – This Proposed Action will not cause or contribute to any new violations or increase the frequency or severity of any existing CO violations in CO maintenance areas, as shown by the results of the microscale (local) CO hot spot analysis contained herein.
- **PM<sub>2.5</sub> Hot Spots** - This project is exempt from conformity requirements under Section 40 CFR part 93.126 of the conformity rule. This section specifically exempts the

reconstruction or renovation of transit buildings and structures such as rail buildings and storage and maintenance facilities from conformity requirements. A project level PM<sub>2.5</sub> qualitative analysis is therefore not required.

- **PM<sub>10</sub> Control Measures** – There are no PM<sub>10</sub> control measures in the current State Implementation Plan.

In summary, the Proposed Action have been determined to be in conformity with the Clean Air Act, as amended, pursuant to all applicable U.S. EPA regulations.

### **Local Impacts - Microscale Analysis**

#### Methodology

In order to assess CO impacts on local air quality from the project, a modeling analysis was conducted to calculate CO concentrations under 2015 No-Build and Proposed Action conditions at sensitive receptor locations in the vicinity of the worst-case traffic intersection and to determine if the proposed project will create violations of federal CO standards. The analysis was conducted using the EPA MOBILE6.2 emissions factor model and the CALQVIEW2 (Windows version of CAL3QHC Version 2) model.

Capacity and queuing analyses were performed for several intersections in the vicinity of the Proposed Action. The analysis was complicated by the fact that several alternatives for roadway configuration related to the Long Wharf Project would have different impacts on intersections in the vicinity of the NHRY. Based on discussions with CTDOT, the I-95 Southbound On-ramp at Sargent Drive was identified as having the worst level of service (LOS) and the worst-case potential impact from the Proposed Action. This intersection does not currently exist and will be reconfigured after the Build Year of 2015.

Capacity and queuing analyses were completed for the following peak periods:

- 2015 morning No-Build and afternoon No-Build scenarios (Build Year) and
- 2015 morning Build and afternoon Build scenarios (Build Year).

CALQVIEW2 is a line source dispersion model that applies the Gaussian dispersion theory to traffic inputs and meteorological conditions to predict CO concentrations from vehicles on the roadway. Air quality impacts from mobile sources are modeled by analyzing queue links and free flow links. Queue links are those that simulate vehicles idling at the stop bar of an intersection. Free flow links simulate vehicles traveling through an intersection. Receptor locations are selected based on where people may be located who may be exposed to the CO produced by vehicles in the area (e.g., sidewalks, outdoor eating establishments). Each receptor was located at a height of 5.9 feet, per EPA guidance.

CALQVIEW2 meteorological and background information is listed in Table 18 below.

**Table 18: CALQVIEW2 Parameters**

Parameter	Value
Averaging time	60 mins
Surface roughness length	175 cm
Settling velocity	0
Deposition velocity	0
Scale conversion factor	0.3048 (units in ft)
Output	1 (in ft)
Wind speed	1 m/s
Wind direction	0
Stability class	4 (D) - Urban
Mixing height	1000 m
1-hour background concentration	4.3 ppm
8-hour background concentration	3.0 ppm
Multiple wind directions	Yes – 10 degree increments
Receptor height	6.0 ft
Signal times	Varies (traffic analysis)
Traffic volumes	Varies (traffic analysis)

Mobile source CO emission factors were modeled using MOBILE6.2. These input files and associated output files are included in Appendix F (MOBILE 6.2 Input and Output Files).

## Results

Results from the model represent the one-hour average CO concentrations at each receptor due to the modeled traffic, and include a background concentration of 4.3 ppm. To determine the eight-hour average concentration at each receptor, the one-hour dispersion result from the model was multiplied by the persistence factor of 0.7. The 2015 AM Build, PM Build, AM No-Build, and PM No-Build conditions were each modeled for the intersection listed above, for a total of 4 model runs. Table 19 below presents the highest predicted CO reading for each model run. Appendix F contains the CALQVIEW2 model output showing all results for each run.

**Table 19: Highest Predicted CO Results**

Model Run	Highest 1-hour Concentration (ppm)	Corresponding 8-hour Concentration (ppm)	Receptor Location
I-95 SB On-ramp @ Sargent Drive 2015 Peak AM No-Build	6.4	4.5	West side of southbound lane at southern mid-block
I-95 SB On-ramp @ Sargent Drive 2015 Peak PM No-Build	8.7	6.1	West side of southbound lane at mid-block
I-95 SB On-ramp @ Sargent Drive 2015 Peak AM Build	6.5	4.6	West side of southbound lane at southern mid-block
I-95 SB On-ramp @ Sargent Drive 2015 Peak PM Build	8.2	5.7	West side of southbound lane at southern mid-block

NAAQS for CO: 1-hour standard of 35.0 ppm, 8-hour standard of 9.0 ppm.

As shown in Table 19, the maximum one-hour and eight-hour CO concentrations result under 2015 conditions in the PM peak traffic conditions. All results are well below the CO NAAQS of 35 ppm for one hour and 9 ppm for eight hours. Thus, the proposed project will not create any violations of federal CO standards. These findings appear to be reasonable, based on the following:

- Air quality monitoring data show that existing CO levels in the area are well below the CO NAAQS. Therefore CO hot spots are highly unlikely in the vicinity of the proposed project.
- The low level of trips generated by the Proposed Action relative to total regional trips is unlikely to negatively impact regional air quality. The VOC, NO<sub>x</sub>, and CO emissions from the transportation system are currently below those allowed by CTDEP. Thus, the effects of increased travel can be accommodated without causing the emission budgets to be violated, and as a result, will not cause or contribute to further violations of the NAAQS. Furthermore, recent monitored ozone exceedances are primarily due to the transport of ozone and other pollutants from beyond Connecticut. The low number of additional vehicle trips is unlikely to cause or contribute to further ozone exceedances.

### **13.3 MITIGATION**

It is not anticipated that any short- or long-term adverse air quality impacts will occur as a result of the project. Therefore, no specific air quality mitigation measures are proposed.

To minimize impacts to air quality during construction the following best management practices will be followed:

- Minimization of exposed erodible earth area to the greatest extent possible.
- Stabilization of exposed earth with grass, pavement, or other cover as early as possible.
- Application of stabilizing agent (i.e., calcium chloride, water) to the work areas and haul roads.
- Covering, shielding, or stabilizing stockpiled material as necessary.
- Use of covered haul trucks.
- To minimize drag out, the incidental transport of soil by construction equipment from unpaved to paved surfaces, rinsing of construction equipment with water or any other equivalent method.
- Use of construction equipment with air pollution control devices.
- Use of “clean” fuels including ultra-low sulfur diesel fuel (15 ppm sulfur), compressed natural gas or emulsified fuels (e.g., Purinox, approved by the California Air Resources Board).
- Eliminating any unnecessary idling to no more than 3 minutes.

#### **13.4 SUMMARY OF IMPACTS**

The proposed project has been evaluated to determine whether the project will cause the NAAQS to be exceeded. Stationary sources from proposed heating and hot water systems are expected to be negligible. CO hot spots are unlikely in the vicinity of the Proposed Action because existing CO levels in the area are already well below the CO NAAQS and the project will not substantially change emission sources/quantities. PM exceedences are not expected. The Proposed Action will not result in new violations, exacerbate existing violations, or interfere with attainment of air quality standards.

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## 14 NOISE

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### 14.1 EXISTING SETTING

There are three categories of noise-sensitive land uses defined by the FTA in their guidance manual entitled *Transit Noise and Vibration Impact Assessment* (FTA-VA-90-103-06, May 2006). A Category 1 Land Use is generally defined as a tract of land where quiet is an essential element in its intended purpose, such as an outdoor concert pavilion or a National Historic Landmark where outdoor interpretation routinely takes place. Category 2 Land Uses include residences and buildings where people sleep, and Category 3 Land Uses include institutions with primarily daytime and evening use, such as schools, churches, and libraries, as well as parklands with both active and passive recreation.

The NHRY is located in a highly urbanized area, surrounded by many noise sources including Interstate 95, approximately 1,855 feet to the east, and a busy industrial and commercial area immediately to the east. The NHRY itself includes a commuter rail station and a parking garage. Other noise sources include the City of New Haven's police station, immediately to the northwest of the rail yard, and the Route 34 connector to I-95, just north of the rail yard.

A site visit was conducted on October 27, 2006 to identify and categorize land uses (receptors) considered to be noise-sensitive within 1,000 feet of the proposed project and to develop a baseline for the existing noise environment at the site. The noise screening distance of 1,000 feet was used based on guidance relative to rail yards and shops contained in Chapter 4 of the FTA manual (May 2006), and is therefore considered to be the study area for the noise impact analysis. Noise-sensitive receptors were looked at from an unobstructed screening distance of 1,000 feet *from the center of noise generating activity on the rail yard* (and 650 feet with intervening buildings and structures). The center of noise generating activity was assumed to be located: north of the Church Street South extension, in close proximity to the EMU Shop.

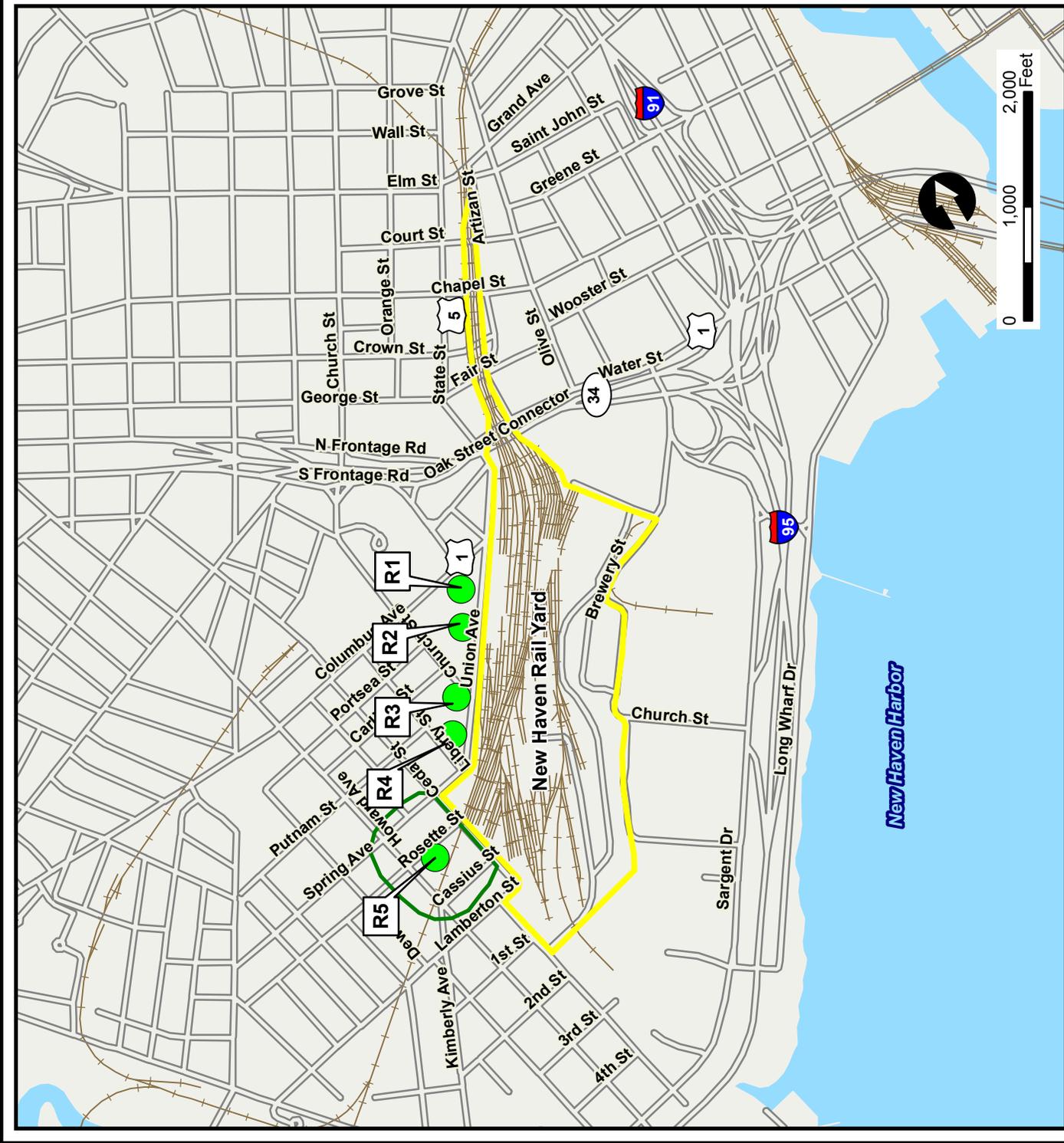
Category 2 noise-sensitive receptors identified within 1,000 feet (unobstructed) of the center of noise generating activity on the rail yard include the Robert T. Wolfe Apartments, the Church Street South Apartments, and residences on Union Avenue south of Church Street. Category 3 noise-sensitive receptors identified within 1,000 feet of the project include and the Hill Seventh Day Adventist Church. These noise sensitive receptors are depicted on Figure 9 as R1-R5.

The receptor labeled as R1 is the Robert T. Wolfe apartment building. It is a seven-story apartment building that fronts Union Avenue and is located across the street from Union Station. The receptor labeled R2 is the Church Street South Apartments, a planned development with residences and its own convenience stores. The units are each two or three stories. Receptor R3 is the Hill Seventh Day Adventist Church, located at the southwest corner of Union Avenue and Church Street. The receptor labeled R4 is a cluster of residential homes and apartment buildings located a bit farther south of the Church Street and Union Avenue intersection. These are two and three story buildings.



**Figure 9**  
**Noise Sensitive Receptor Locations**  
New Haven Rail Yard EA/EIE  
New Haven, CT  
State Project # 301-0088

- Rail Yard Property
- Noise Sensitive Receptors
- Noise Sensitive Receptor Group
- Roads
- Rail
- Open Water



The loop tracks were also identified as a major contributor to noise activity. However, they are, relatively speaking, far from the identified center of noise generating activity on the rail yard. Therefore, a second center of noise generating activity, in the midst of the loop tracks, was also identified in the noise analysis. A cluster of residences along Hallock Avenue, located within 1,000 feet (unobstructed) from this second center of noise generating activity, were defined and labeled R5 on Figure 9. R5 is comprised of mostly two-story, single and multi-family dwellings.

Existing noise levels, for this specific Proposed Action, were estimated using the FTA General Noise Assessment Spreadsheet (FTANOISE) in conjunction with the FTA guidance manual. To conduct the analysis, existing noise sources within the project area were identified and the distance from each noise source to each sensitive receptor was determined.

### Existing Noise Sources

Although there are many noise sources in this area of New Haven, there are a few which stand out for the purposes of this analysis. Union Avenue and Church Street South provide access to the rail yard. These two roadways are located between the Proposed Action and the noise receptors. Therefore, traffic along these adjacent city streets (Union Avenue and Church Street South) is considered a prominent source of existing noise for this analysis. Another important existing noise source is the existing NHRY. One particular element of the rail yard, the loop tracks, was identified as particularly noisy and, therefore, they were also singled out as a noise source. There have been a few noise-related complaints from residents living along Hallock Avenue about the noise generated from these loop tracks. Cars are joined on the loop tracks to form or “build” a train, and this process generates noise.

All trains moving through the rail yard are limited to a speed of 10 mph, although trains moving along the loop tracks are likely to be moving no more than 5 mph. On average, there are two diesel trains and two or three electric trains moving into and out of the loop tracks each day *and* each night.

### *Roadways*

According to the FTA guidance manual, Union Avenue and Church Street South are designated as “Other Roadways” for the purpose of estimating existing noise exposure at nearby noise sensitive land uses. “Other Roadways” are defined as “Parkways with traffic at 55 mph, but without trucks, and city streets with the equivalent of 75 or more heavy trucks per hour and 300 or more medium trucks per hour at 30 mph.”

The 2006 average annual daily traffic (AADT) volumes for Union Avenue and Church Street South were derived by converting peak hour traffic counts. The greatest peak hour (p.m. peak for both Union Avenue and Church Street South) was divided by 10% for each street. Using this methodology, Union Street carried an AADT of 8,500 vehicles and Church Street South carried an AADT of 8,300 vehicles.

From these calculated AADT’s, the average number of vehicles per hour during daytime hours and nighttime hours was then derived for each street and was used as input into FTANOISE in

order to calculate existing noise levels at each of the identified noise sensitive receptors. The average number of vehicles per hour for each street for both daytime and nighttime hours was derived by assigning 80% of the AADT to the daytime and 20% to the nighttime, and then dividing each AADT fraction by the number of hours comprising the respective daytime (7 A.M. to 10 P.M.) and nighttime (10 P.M. to 7 A.M.) time periods. The results are presented in Table 20: Average Number of Vehicles per Hour on Streets with the Project Study Area.

**Table 20: Average Number of Vehicles per Hour on Streets within the Project Study Area**

Street Name	Average Number of Vehicles Per Hour	
	Daytime Hours (7AM to 10 PM)	Nighttime Hours (10 PM to 7 AM)
Union Avenue	453	188
Church Street South	442	184

Source: Fitzgerald & Halliday, Inc. 2007.

### *Rail Yard*

The existing NHRY constitutes another important noise source in the project study area. The number of trains per hour in the daytime and the number of trains per hour in the nighttime were used as input to the FTANOISE to calculate the noise generated by the rail yard. Rail yard characteristics, such as the type of track, whether there are barriers, aerial structures, and intervening rows were also input into the FTANOISE analysis.

Data was obtained through coordination with CTDOT and PB Americas project engineers and used as input for the noise analysis. The NHRY currently processes up to seven trains per hour during the daytime and up to nine trains per hour during the nighttime. For this analysis, it was assumed that these numbers would not decrease over time. It was assumed that the tracks in the rail yard are a mix of jointed and welded rail. The only embedded rail will be in the new shops, which was assumed for the 2030 future conditions. For a conservative (“worst case”) scenario, it was also assumed that there were no aerial structures, barriers, or intervening rows for either the existing or future conditions.

### *Loop Tracks*

The loop tracks are where trains lay over, are stored, and where cars are joined, or “built” to form a train. These processes generate noise.

All trains moving through the rail yard are limited to a speed of 10 mph, although trains moving along the loop tracks are likely to be moving no more than 5 mph. On average, there are two diesel trains and two or three EMUs moving into and out of the loop tracks each day *and* each night.

## Existing Noise Levels

Noise from nearby streets and the rail yard all contribute to existing noise levels. Traffic volumes (average number of vehicles per hour, both in the daytime and the nighttime), automobile speed limits, trains per hour, and the distance between each noise source and each noise sensitive receptor were used as input in the FTANOISE model to estimate the existing noise levels at each of the four noise sensitive receptors. Existing (2006) noise levels are expressed by FTANOISE as day-night sound level ( $L_{dn}$ ), which describes a receiver's cumulative noise exposure from all events over a full 24 hours, with events between 10 P.M. and 7 A.M. increased by 10 decibels to account for greater nighttime sensitivity to noise. The estimated existing noise levels at each of the noise sensitive receptors are presented in Table 21. A series of FTANOISE spreadsheets complete with noise model input data and output results are included in Appendix B as part of the Technical Memorandum entitled, *FTA General Noise Assessment for the New Haven Rail Maintenance Facility Improvements* (Fitzgerald & Halliday, Inc. (FHI), May 2007).

**Table 21: Estimated Existing (2006) Noise Levels**

Receptor	Site Location	Estimated Existing	Land Use Category
		Noise Level (dBA) $L_{dn}$	
R1	Robert T. Wolfe apartment building	59	2
R2	Church Street South Apartments	59	2
R3	Hill Seventh Day Adventist Church	53	3
R4	Residences south of Church Street South and Union Avenue intersection	52	2
R5	Residential cluster along Hallock Avenue	64	2

Source: Fitzgerald & Halliday, Inc., May 2007.

## **14.2 DIRECT AND INDIRECT IMPACTS ON NOISE SENSITIVE RECEPTORS**

### **No-Build Alternative**

The No-Build Alternative will be a continuance of existing conditions, thus noise levels will be similar to those reported in Table 21.

### **Proposed Action**

The Proposed Action includes installing twenty-five new storage yard tracks, a two-track, 10-car S&I shop, a component change-out shop with three tracks capable of holding thirteen rail cars and adjacent support shops, new wheel true shops, a Maintenance-of-Way building with offices and shops, a rail car washer, a heavy repair and paint shop, and a new parking structure and employee overpass.

Based on the above, and through coordination with PB Americas project engineers, seven trains per hour in the daytime and nine trains in the nighttime were used as input into the FTANOISE spreadsheet to estimate future (2030) project noise levels at nearby noise sensitive receptors.

Nine diesel trains and twelve electric trains would come in and out of the proposed storage tracks each day. These movements would be split evenly between night and day. New diesel storage tracks are proposed to be equipped with standby power systems that will keep the coaches powered up even when the diesel trains are shut down, allowing the diesel trains to be shut down shortly after entering the storage tracks and started only shortly before leaving the storage tracks. These standby power systems will alleviate the noise generated by diesel trains.

Future noise levels *strictly attributed* to the New Haven Rail Maintenance Facility (i.e., excluding other noise sources in the project area) were predicted using FTANOISE for the five noise sensitive receptors located within the 1,000 foot noise screening buffer. Future noise levels as shown in Table 22 reflect *only noise associated with the project by itself*.

**Table 22: Estimated Future (2030) Project-Only Noise Levels**

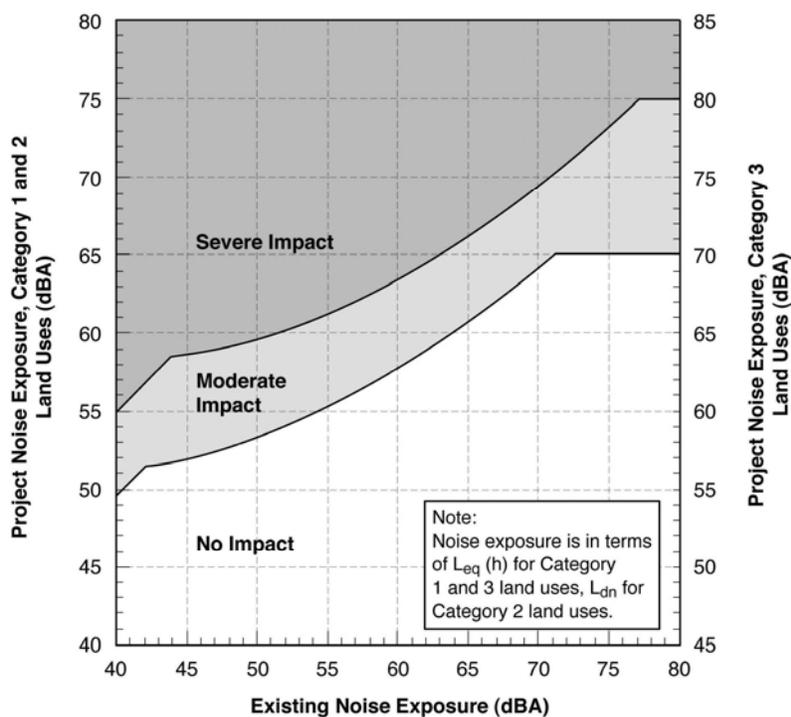
Receptor	Site Location	Estimated Future	
		Noise Level (dBA L <sub>dn</sub> )	Land Use Category
R1	Robert T. Wolfe apartment building	53	2
R2	Church Street South Apartments	54	2
R3	Hill Seventh Day Adventist Church	48	3
R4	Residences south of Church Street South and Union Avenue intersection	53	2
R5	Residential cluster along hillock Avenue	54	2

Source: Fitzgerald & Halliday, Inc., May 2007.

To determine whether the Proposed Action will result in a noise impact at any one of the five noise sensitive receptors, a comparison of the existing (2006) outdoor noise levels (Table 21) and future (2030) outdoor noise levels resulting from the project (Table 22) is necessary. According to the FTA guidance manual, Figure 10: Noise Impact Criteria for Transit Projects (FTA May 2006), is used to facilitate this comparison.

To conduct the comparison, a vertical line is drawn that intersects the horizontal axis at the decibel level representative of the existing noise exposure (values taken from Table 21) for the specific noise sensitive receptor being compared. Similarly, a horizontal line is drawn that intersects a vertical axis at the decibel level representative of the project noise exposure (values taken from Table 22) for the same noise sensitive receptor. The vertical axis that is used depends on the Land Use Category of the noise sensitive receptor being evaluated. For this project, noise sensitive receptors 1, 2, 4, and 5 are residential land uses, and are classified as Category 2 Land Uses. Noise sensitive receptor 3, a church, is a Category 3 land use.

**Figure 10: Noise Impact Criteria for Transit Projects**



Source: FTA, May 2006.

The left vertical axis of Figure 10 is used to represent the project noise exposure. The intersection of the existing noise exposure (vertically drawn line) with the project noise exposure (horizontally drawn line) represents the degree of project noise impact at that specific noise sensitive receptor. For instance, receptor #1 (R1) has an estimated existing (2006) noise exposure of 59 dBA  $L_{dn}$  (from Table 21) and a project noise exposure (2030) of 53 dBA  $L_{dn}$  (from Table 22). The intersection of these two noise levels when plotted on the graph illustrated in Figure 10 falls within the No Impact range. Table 23: Anticipated Noise Impact from the Proposed NHRY Project documents the results that are obtained when applying the aforementioned procedure to the five noise sensitive receptors.

**Table 23: Anticipated Noise Impact from the Proposed Action**

Noise Sensitive Receptor	Existing (2006) Noise Levels	Future (2030) Project-Only Noise Levels	Impact Threshold	Result
R1	59 dBA ( $L_{dn}$ )	53 dBA ( $L_{dn}$ )	57 dBA ( $L_{dn}$ )	No Impact
R2	59 dBA ( $L_{dn}$ )	54 dBA ( $L_{dn}$ )	57 dBA ( $L_{dn}$ )	No Impact
R3	53 dBA ( $L_{dn}$ )	48 dBA ( $L_{dn}$ )	54 dBA ( $L_{dn}$ )	No Impact
R4	52 dBA ( $L_{dn}$ )	53 dBA ( $L_{dn}$ )	54 dBA ( $L_{dn}$ )	No Impact
R5	64 dBA ( $L_{dn}$ )	54 dBA ( $L_{dn}$ )	59 dBA ( $L_{dn}$ )	No Impact

For Category 2 Land Uses, noise impacts at specific noise sensitive receptors must also be evaluated in terms of cumulative noise, estimated by the addition of a project-related noise

exposure (from Table 22) and the existing noise exposure (from Table 21). The four residential noise sensitive receptors, which are Category 2 Land Uses, were evaluated with respect to cumulative noise impact using Table 24: Noise Impact Criteria: Effect on Cumulative Noise Exposure, which has been reproduced directly from the FTA noise guidance manual. Category 3 Land Uses are not evaluated with respect to cumulative noise impacts, as these land uses are considered less sensitive to noise than Land Use Categories 1 and 2.

**Table 24: Noise Impact Criteria: Effect on Cumulative Noise Exposure**

<b>Noise Impact Criteria: Effect on Cumulative Noise Exposure</b>			
<b><math>L_{dn}</math> or <math>L_{eq}</math> in dBA (rounded to nearest whole decibel)</b>			
<b>Existing Noise Exposure</b>	<b>Allowable Project Noise Exposure</b>	<b>Allowable Combined Total Noise Exposure</b>	<b>Allowable Noise Exposure Increase</b>
45	51	52	7
50	53	55	5
55	55	58	3
60	57	62	2
65	60	66	1
70	64	71	1
75	65	75	0

Source: FTA, May 2006.

As previously mentioned, the existing noise exposure at site R1 is 59 dBA ( $L_{dn}$ ), and the project noise exposure is 53 dBA ( $L_{dn}$ ). According to the second column in Table 24, the allowable project noise exposure can be as high as 57 dBA ( $L_{dn}$ ) when the existing noise exposure (column one) is 59 dBA ( $L_{dn}$ ) before a cumulative noise impact is realized. Since the NHRY project noise exposure at receptor R1 (53 dBA ( $L_{dn}$ )) is well below the allowable project noise exposure for an existing noise exposure of 59 dBA ( $L_{dn}$ ), a cumulative noise impact will not occur at this residential noise sensitive receptor from the NHRY project. Similar results are also obtained when applying this method to noise sensitive receptors 2, 4, and 5, the other Category 2 noise sensitive receptors.

For complete and detailed information pertaining to the technical derivation of future project noise exposure levels and the determination of noise impact at identified noise sensitive receptors, the reader is encouraged to refer to the comprehensive Technical Memorandum entitled, FTA General Noise Assessment for the New Haven Rail Facility Improvements (FHI, March 2008), included as Appendix B to this EA.

### **Construction Noise Assessment**

The NHRY is situated in an urban area, with Interstate 95 and an industrial area to the east and Route 34 and the downtown central business district to the northwest. Union Station is located adjacent to the rail yard, with supporting land uses, such as parking garages nearby. The Hill residential neighborhood is to the south and west of the NHRY. Heavy equipment, vehicles, and construction activity creates noise which impacts nearby residential and other sensitive land uses,

such as places of worship. During the construction period, continuous as well as intermittent (or impulse) noise will be experienced in the immediate project vicinity, which may be perceived by some nearby residents to be intrusive, annoying, and discomforting. For rail yards, noise sensitive land uses of particular concern are those within screening distances of 1000 feet (unobstructed by any buildings or other structures that would provide a buffer) or 650 feet (obstructed) of the noise source.

Noise from construction activities was evaluated for the Proposed Action in accordance with FTA Qualitative Noise Assessment procedures stipulated in Chapter 12 of FTA's *Transit Noise and Vibration Impact Assessment* (FTA-VA-90-1003-06, May 2006). A qualitative noise analysis was deemed appropriate for this project for several reasons:

- Construction is occurring at many locations within the rail yard and at varying times and for varying lengths of time.
- Ambient noise of the surrounding urban environment, coupled with existing rail yard operations, is already high and in effect will mask the construction noise.
- With the exception of pile driving, construction activity is anticipated to be of moderate intensity, including foundation work, building erection, track laying, earthwork and excavation, and materials transport.
- Construction of the Proposed Action will begin in approximately 2008 and be completed by 2022. This analysis is based on current estimated timeframes

Table 25 provides typical noise emission levels in A-weighted decibels (dBA) 50 feet from various types of construction equipment. These are the types of construction equipment, among others, that will be used to demolish existing buildings and ancillary railroad facilities, prepare the site, and construct the new rail yard buildings and associated improvements.

In general, noise levels from construction equipment are reduced by 6 dBA for each doubling of distance from the construction equipment noise source. For example, a dozer with a noise level of 85 dBA at 50 feet will have a noise level of 79 dBA at 100 feet, 73 dBA at 200 feet, 67 dBA at 400 feet, 61 dBA at 800 feet, and so forth. Buildings and other barriers located between a construction noise source and a sensitive noise receptor further reduce the intensity of construction noise.

**Table 25: Noise Emission Levels from Construction Equipment**

<b>Equipment</b>	<b>Typical Noise Level (dBA) 50 ft. from Source</b>
Air Compressor	81
Backhoe	80
Ballast Equalizer	82
Ballast Tamper	83
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Derrick	88
Crane, Mobile	83
Dozers	85
Generator	81
Graders	85
Impact Wrench	85
Jack Hammer	88
Loader	85
Paver	89
Pile drivers (impact)	101
Pile drivers (sonic)	96
Pneumatic Tool	85
Pump	76
Rail Saw	90
Rock Drill	98
Roller	74
Saw	76
Scarifier	83
Scraper	89
Shovel	82
Spike Driver	77
Tie Cutter	84
Tie Handler	80
Tie Inserter	85
Truck	88

Source: FTA, *Transit Noise and Vibration Impact Assessment*, FTA-VA-90-1003-06, May 2006. Based on EPA Report (“Noise from Construction Equipment and Operations, Building Equipment and Home Appliances” NTID300.1, December 31, 1971), measured data from railroad construction equipment taken during the Northeast Corridor Improvement Project, and other measured data.

Construction for the Proposed Action will be located in two general areas on the New Haven Rail Yard (NHRY) site:

- Southwest of Church Street extension
- Northeast of Church Street Extension

## Southwest of Church Street Extension

Construction activities taking place southwest of Church Street Extension will involve the laying down of new storage tracks, improvements to existing storage tracks, construction of the heavy paint/repair shop, and improvements to the existing car shop and diesel shop. Construction vehicles and equipment will enter the site from the Long Wharf Avenue and Brewery Street entrances. The Hallock Avenue entrance (which abuts several homes) will not be used for construction.

Work on the storage tracks will involve some excavation, earthmoving, and grading, placement of subsurface utilities, installation of manifold system for dumping of waste, laying down of subsurface ballast, rail, ties, and stone. Construction will also include stone tamping. Some of the equipment used for this work includes dozers, backhoes, dump trucks, loaders, graders, and cranes. Cranes are also used to set-up the framework for the overhead catenary structures. Construction of the heavy paint/repair shop will involve the use of pile drivers. Piles will be used to provide foundation support for the heavy paint/repair shop. After the ground is augured to ensure the absence of utility lines, a pile driver will be used to fix the position of the piles. The use of pile drivers will be minimized, and fewer than 20 piles will be needed southwest of Church Street Extension. The pile driving southwest of the Church Street Extension will be limited in duration, taking between two weeks and one month to complete. Cranes will also be used in the building of the heavy paint/repair shop.

Construction work on the west end storage tracks will take place between 2008 and 2012. Construction of the heavy paint/repair shop and improvements to the existing car shop and diesel shop will also take place between 2008 and 2012. Construction work on the east end rail yard will take place between 2012 and 2015.

### *Phase 1 — 2008–2012*

The noisiest construction activity between 2008 and 2012 will involve the use of pile drivers for the construction of the heavy paint/repair shop. This activity will take place approximately 650 feet from the nearest noise sensitive receptors (a residential cluster), but it will be limited in its duration (up to one month).

<b>Noisiest Equipment 2008–2012 Southwest of Church St. Ext.</b>	<b>Typical Noise Level (dBA) 50 ft. from Source</b>	<b>Noise Level (dBA) 650 ft. from Source*</b>
Pile drivers (impact)	101	Up to 83

\*Assumes reduction of 6 (dBA) for additional 50 feet from noise source.

The noise level at the noise sensitive receptor (residential cluster) located 650 feet from the noise source (the pile driver) is 83 dBA. This noise level does not exceed daytime (90 dBA) levels for residential, or daytime (100 dBA) or nighttime (100 dBA) levels for commercial or industrial. Therefore, there is no anticipated impact.

However, this noise level of 83 dBA does exceed the nighttime (80 dBA) levels for residential. Therefore, restrictions will be placed on nighttime construction (relating to pile driving activities) to avoid this impact.

*Phase 2 — 2012–2015*

The noisiest and most persistent construction activity between 2012 and 2015 will be the use of cranes and trucks. Construction activity will be located approximately 900 feet from the nearest noise sensitive receptors (a residential cluster).

<b>Noisiest Equipment 2012-2015 Southwest of Church St. Ext.</b>	<b>Typical Noise Level (dBA) 50 ft. from Source</b>	<b>Noise Level (dBA) 900 ft. from Source*</b>
Crane (mobile)	83	Up to 59
Trucks	88	Up to 64
Combined Noise Level**	89	Up to 65

\*Assumes reduction of 6 (dBA) for additional 50 feet from noise source.

\*\*Because noise is measured on a decibel scale, combining two noise levels is not achieved by simple addition. When combining two noise levels whose values differ by 5 decibels, the combined noise level is 1 decibel greater than the highest of the two noise levels.

The combined noise level from cranes and trucks (up to 65 dBA) is well below daytime (90 dBA) or nighttime (80 dBA) levels for residential, or daytime (100 dBA) or nighttime (100 dBA) levels for commercial or industrial. Therefore, there is no anticipated impact.

**Northeast of Church Street Extension**

Construction activities taking place northeast of Church Street Extension will involve construction of the component change-out shop, service and inspection shop, independent wheel true shop, and improvements to the EMU shop. Construction vehicles will only enter the site from the Long Wharf and Brewery Street entrances minimizing the noise impacts to the residential buildings.

Construction on the northeast side of Church Street Extension will be similar in nature throughout the duration of construction (all three phases, from 2008–2020). Work on the component change-out shop, service and inspection shop, and independent wheel true shop will involve some excavation, earth moving, and building construction. Some of the equipment used for this work includes dozers, backhoes, dump trucks, loaders, graders, and cranes. A large number of piles will need to be driven into place. The piles are used in the foundation support for the heavy paint/repair shop.

The noisiest construction activities taking place northeast of Church Street Extension, and within approximately 780 feet of noise sensitive receptors, involves the use of pile drivers. There are intervening structures such as Union Station and other buildings between the construction

activities and the noise sensitive receptors that will provide additional reduction in noise levels. Noise sensitive receptors within 1,000 feet (obstructed) of the construction activity include: Robert T. Wolfe apartment building, Church Street South Apartments, Hill Seventh Day Adventist Church, and residences south of the Church Street South and Union Avenue intersection.

<b>Noisiest Equipment Northeast of Church St. Ext.</b>	<b>Typical Noise Level (dBA) 50 ft. from Source</b>	<b>Noise Level (dBA) 780 ft. from Source*</b>
Pile drivers (impact)	101	Up to 83

\*Assumes reduction of 6 (dBA) for additional 50 feet from noise source. The estimated noise level 780 feet from the source also does not take into account the dampening effect that will result from the intervening structures so in reality the noise level at the noise sensitive receptors will be lower than the reported value in this table.

The noise level at the noise sensitive receptors located about 780 feet from the noise source (pile driver) is 83 dBA. This noise level does not exceed daytime (90 dBA) levels for residential, or daytime (100 dBA) or nighttime (100 dBA) levels for commercial or industrial. Therefore, there is no anticipated impact.

However, the noise level of 83 dBA does exceed the nighttime (80 dBA) levels for residential. Therefore, restrictions will be placed on nighttime construction activities to avoid this impact.

### 14.3 MITIGATION

The project will not result in a noise impact to any of the identified noise sensitive land uses (receptors R1 through R5). There are no noise impacts resulting from the Proposed Action. As such, mitigation measures are not required as part of the project.

While construction noise is exempt under Section 22a-69-1.8(g) of the RCSA, construction documents will require the contractor to limit the duration and intensity of noise generated by construction. To mitigate the potential impacts during construction:

- Noise abatement measures in accordance with CTDOT Form 816 will be included in construction specifications. Such measures include appropriate mufflers on all construction vehicles and restrictions on hours of operation. Nighttime activities will be avoided. Any nighttime construction will be coordinated with the City and surrounding residents and businesses.
- Truck traffic will be routed onto streets with the fewest homes. Construction vehicles and equipment will enter the site from Long Wharf Avenue and Brewery Street entrance, which has good access to I-95, I-91, and Route 34. The Hallock Avenue entrance (adjacent to several residences) will be restricted from use for construction. And, it is not anticipated that Union Avenue will need to be used for construction purposes.
- There are some existing obstructions, such as buildings, already buffering noise. However, there may be an additional need for the erection of temporary noise barriers around the work site where such barriers are deemed effective at buffering adjacent land uses from construction noise.
- Ensure muffler devices on construction equipment are installed and maintained properly.

- The project team will conduct ongoing coordination with the City of New Haven to employ other measures that may be effective to minimize noise disturbance to nearby residents.
- Overall, the Proposed Action is envisioned to be in compliance with the Connecticut Noise Regulations. The City of New Haven Noise Ordinance is contained within Section 18-19 of the City's Zoning Regulations. While State of Connecticut projects are not required to comply with local zoning, the operation of the Proposed Action will be conducted in a manner that meets the objectives of the City's noise regulations to the extent feasible.

#### **14.4 SUMMARY OF IMPACTS**

The Proposed Action will not result in any adverse noise impacts to nearby noise sensitive receptors as determined by the FTANOISE analysis conducted for this project.

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## 15 SECTION 106 RESOURCES

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### 15.1 EXISTING SETTING

Section 106 of the National Historic Preservation Act (NHPA) of 1966 (16 U.S.C. 470(f)) states that any federally funded project must “take into account the effect of the undertaking on any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register of Historic Places.” Section 106 further requires agencies to seek comments from a representative of the Advisory Council on Historic Preservation (ACHP) and from the State Historic Preservation Officer (SHPO).

Potential historic, architectural, and archaeological resources located within the vicinity of the Proposed Action were comprehensively investigated by CTDOT in the 1990s, in order to properly manage important cultural resources during modernization efforts at the rail yard. During those investigations, the rail yard was identified as a significant example of Connecticut’s late 19<sup>th</sup> and early 20<sup>th</sup> century railroad-related technology. It was determined eligible for the National Register of Historic Places (National Register) as a complex of interrelated buildings and potential archaeological remains. The entire property therefore constitutes a single Section 106 resource.

Within a historic complex such as the rail yard, there may be structural elements or buildings that are not historically important mixed with those that are. The historically important structures are called “contributing resources”. To be considered a contributing resource, a building or structure must be over 50 years old and meet a number of other National Register criteria. The NHRY was identified as having a combination of contributing and non-contributing resources.

#### **Historical Significance of the Rail Yard**

As described in the *Historic American Engineering Record Documentation for New Haven Rail Yard* (HAER No. CT-160, Public Archaeology Survey Team, 2006), the rail yard’s historical significance derives from its role in the operations of the New York, New Haven, and Hartford Railroad, commonly called the New Haven Railroad. During the late 1800s, the New Haven Railroad grew to achieve a near monopoly of rail service in southern New England, providing both passenger and freight service within this densely industrialized region. Prior to the early 1900s, the NHRY was the railroad’s largest and most complete shop complex. The rail yard was the site of construction for large numbers of locomotives and freight cars and of repair and general maintenance of rolling stock.

The capabilities of the NHRY shops were vital in maintaining the railroad’s viability at two critical points of the New Haven Railroad’s history in the 1900s. After World War One, when the railroad found itself with an aged and obsolete freight car fleet but no capital for purchasing new equipment, the railroad initiated its own large-scale freight-car construction and rebuilding program. It improved and expanded the shops at New Haven, which became the center for the program. In the early 1960s, short on locomotive power, the railroad undertook another

rebuilding program, this one focused on rebuilding its pioneering electric locomotives. The rebuilding of the EP-5 passenger locomotives and the refurbishing of the EF-4 freight locomotives took place at the Lamberton Street shops. The more efficient electric service (compared to all-diesel) postponed, for a short while, the company's ultimate descent into bankruptcy.

### **Prior Detailed Historic Investigations and Mitigation Measures**

During the intensive cultural resource investigations undertaken by CTDOT in the 1990s, buildings older than 50 years old were evaluated to determine their significance as part of the complex and the potential for archaeological resources was investigated. Eight buildings potentially affected by rail yard improvements were deemed at that time to be contributing resources, and the vicinity of the former roundhouse and turntables was determined to possess potential for archaeological resources.

Coordination with the ACHP and SHPO relative to the potential effects of rail yard improvements on cultural resources resulted in a Memorandum of Agreement (MOA) which laid out mitigation measures for potential adverse effects, including building demolition. The MOA for *The Reconstruction of the Rail Maintenance and Storage Facilities in the New Haven Rail Yard and Reconstruction of the New Haven Interlocking in New Haven, Connecticut* was formulated by agreement among the FTA, FRA, National Railroad Passenger Corporation (Amtrak), SHPO, CTDOT, and the ACHP. It was accepted (signed) by the ACHP on December 2, 1999. The MOA recognized a broad program of demolition and construction activities in the rail yard that would affect historic resources. To mitigate those effects, the MOA required CTDOT to undertake the following stipulations:

- 1) Historic American Engineering Record (HAER) documentation of the significant buildings, interlocking switches and control panel at the yard (that would be demolished)
- 2) potential donation of historic relays and controls to the Smithsonian Institute
- 3) potential donation of railroad-related structures or materials to railroad/trolley museums
- 4) preparation of an article on the history of the NHRY for the Society for Industrial Archeology, New England Chapters Newsletter
- 5) development of a public-oriented information program focused on the history and technology of the NHRY
- 6) archaeological monitoring of the roundhouse and turntable locations for any soils investigations or demolition and construction projects affecting the roundhouse/turntable areas.

CTDOT has already undertaken these stipulations as needed to respond to changes in the rail yard. CTDOT documented the eight significant buildings previously identified for demolition, including the interlocking switches and control panel, in the *Historic American Engineering Record Documentation for New Haven Rail Yard*, HAER No. CT-160 (prepared by the Public Archaeology Survey Team, Inc. [PAST] in June 2006). In 2006, SHPO accepted the HAER documentation and at the same time, noted that CTDOT had satisfied all of the mitigative measures in the MOA (correspondence from SHPO dated August 10, 2006.)

## **Existing Historic Resources**

For the purposes of this EA/4(f), the area of potential effect (APE) was determined to coincide with the boundaries of the NHRY itself. No historic resources outside or adjacent to the yard would be directly or indirectly (visually, acoustically) impacted by the Proposed Action. The APE is delineated in Figure 3 by the rail yard property lines.

The historic character of the NHRY is detailed below. Its National Register status stems from its association with southern New England's most important rail carrier of the late nineteenth and first half of the twentieth centuries, the New York, New Haven and Hartford Railroad. In addition to a near monopoly on freight in this heavily industrialized region, the railroad operated one of the busiest passenger services in the country. The buildings in the rail yard reflect operational support functions: building and repairing locomotives and freight cars, material storage, crew facilities, train control and central heating. Although sometimes overshadowed by other shop facilities, the New Haven yard played an important role throughout the railroad's long history.

### *Historical Background*

This discussion is based on the 2006 Historic American Engineering Record documentation of the rail yard (HAER report). The yard was built by and for the New York & New Haven Railroad Company, one of the predecessors of the New York, New Haven & Hartford Railroad, which once operated the main freight and passenger lines in the Boston to New York corridor. The company was first chartered in 1844 and began operation in 1849, connecting the city of New Haven to New York's Harlem Railroad (HAER Report).

Construction of the yard began in 1868, when the New York & New Haven Railroad purchased twenty acres of low-lying land near New Haven harbor. The area was filled and graded prior to building of the first shops in 1869. The early buildings were constructed of brick and included a roundhouse and blacksmith, lumber, storage, paint and machine shops.

The New York, New Haven & Hartford Railroad Company (commonly known as the New Haven) was formed in 1872, when the New York to New Haven and the Hartford to New Haven Railroads were merged. The company grew rapidly in its early years through the acquisition of over 25 smaller railroad companies. The company's original lines, which measured 450 miles, measured 2,047 miles by 1900.

The New Haven initially ran single tracks throughout its system, but double tracking on the company's lines began in 1853. The increase to four tracks began in the 1887 and continued until the early 1900s. This increase to four tracks was part of an extensive plan that would eventually allow for the electrification of the main line system. The NY, NY & H Railroad began to experiment with the electrification of a number of their smaller lines beginning in the early 1890s. Electric lines held the same appeal that they do for us today – they were clean and they were relatively safe (when compared to steam engines). The State of New York passed legislation in 1903 that forbade all steam trains from entering New York City after 1908 as a matter of public safety. In 1907, the first electrically powered train ran on the New Haven line from Grand Central Terminal to New Rochelle, New York. Around this same time the company

opened two new shops at each end of the line in New York in Boston were built. These new additions along with a newly built freight facility at Cedar Hill in New Haven consigned the Lamberton Street Shops, or Lamberton Yard, as this rail yard area was known, to a secondary position.

J.P. Morgan gained control of the company around the turn of the century. He sought to create a monopoly on New England transportation. By using the New Haven Railroad as his monetary power base, he acquired hundreds of trolley and railroad lines and steamship companies. This string of acquisitions ended a decade later with the company close to financial collapse and Morgan in violation of a number of Federal Anti-Trust Laws.

During World War I, the federal government took control of the New Haven Railroad with United States Railroad Administration (USRA) taking control of operations. Under the USRA, the company regained stability. In the 1920s the New Haven expanded into the rubber tire transport area, creating a bus and trucking subsidiary known as “The New England Transportation Company.” The company weathered a series of highs and lows throughout the depression and WWII and resultant modernization programs of the late 1940s created one of the most modern passenger lines in the country.

The Lamberton shops in New Haven regained importance again in the 1920s after the line took on a fleet of gasoline powered self-propelled railcars as a cost-cutting measure. These cars were serviced and stored at the Lamberton Yard (HAER 8). During this same decade, over 12,000 boxcars were refurbished at the Lamberton Shops, another cost cutting measure that both helped the company forestall bankruptcy and saved the yards from imminent closure. The rebuilding program extended the life of the company’s rolling stock, which continued to be used through the Second World War. (HAER, Page 8)

The domestic rationing during World War II resulted in a cessation in physical improvements for the yard. All resources were funneled into maintenance of way and rolling stock to keep up with an increasing freight demand from the nation’s arsenals. Shortly following the war, the New Haven built a service building to service diesel engines in 1947 and Building 10 in 1948 (HAER p 9).

The new construction in the yard was even more utilitarian than the early buildings. Steel framing and truss systems provided a framework for solid concrete block structures, devoid of any ornament. These buildings were both more efficient and better equipped than the earlier structures, almost all of which were demolished during the second half of the twentieth century.

The great floods in 1955, the newly instituted interstate highway system and the southern migration of much of the area’s industry resulted in bankruptcy for the company in 1961. Finally, in 1969, the company was absorbed by the Pennsylvania Central Transportation Company. Only three years later the Penn Central went bankrupt and the rail system was divided between two federally supported entities. Amtrak took control of all long haul passenger service beginning in 1971. ConRail took over operation of all freight and passenger commuter service when it was created in 1976. In 1983, Metro North, a company jointly owned by Connecticut and New York, assumed control of commuter rail traffic along the line.

The buildings in the New Haven Rail Yard are associated with southern New England's most important rail carrier of the late nineteenth and first half of the twentieth centuries, the New York, New Haven and Hartford Railroad. In addition to a near monopoly on freight in this heavily industrialized region, the railroad operated one of the busiest passenger services in the country. The buildings in the rail yard reflect operational support functions: building and repairing locomotives and freight cars, material storage, crew facilities, train control and central heating. Although sometimes overshadowed by other shop facilities, the New Haven yard played an important role throughout the railroad's long history. The rail yard is considered a National Register-eligible resource at the state and national levels. It is significant under Criterion A for its contribution to the development of the national transportation system 1869-1969 and a key link in the development of industry in New England. It is also significant under Criterion C in that the buildings and yard layout typify the large rail yards of the era 1869-1969.

The only archaeologically sensitive resource within the bounds of the Proposed Action is the Spring Street turntable pit. Relic portions of the turntable, dating to 1869, remain buried in place. The turntable is located in the vicinity of the southwest corner of the proposed Independent Wheel True Shop (Number 4 on Figure 3) and the proposed road and parking lot just west of that proposed shop.

Due to a finding of adverse effect for a prior project, federal and state –funded projects in the rail yard are conducted in accordance with a 1998 Memorandum of Agreement among the FTA, the Advisory Council on Historic Preservation, the Connecticut Department of Transportation and the Connecticut State Historic Preservation Office (SHPO).

### **Resources Impacted by Current Project**

Investigations for this EA/4(f) identified one contributing historic resource potentially affected by the Proposed Action. It was documented to Connecticut state standards in 2006-2007. This resource is the Stores Facility, also known as Building 10 (see pictures next page). Built in 1947, Building 10 was one of the long narrow structures in the area of the historic Lamberton Street Shops. As part of the shops complex, the building played a role in constructing and rebuilding the New Haven Railroad's rolling stock, which was critical to the railroad's success and longevity in the late 19<sup>th</sup> and early 20<sup>th</sup> Centuries. After World War One, in the 1920s, over 12,000 boxcars were refurbished at the Lamberton Shops, a cost-cutting measure that helped the company forestall bankruptcy and saved the yard from imminent closure. It is a contributing component of the National Register-eligible rail yard. It is significant under Criterion A for its contribution to the development of the national transportation system 1869-1969 and a key link in the development of industry in New England. It is also significant under Criterion C in that the buildings and yard layout typify the large rail yards of the era 1869-1969.



*Building 10: northern elevation*



*Building 10: eastern elevation*

## **15.2 FINDING OF EFFECT ON SECTION 106 RESOURCES**

### **No-Build Alternative**

The No-Build Alternative would be a continuance of existing conditions and would not result in any adverse effects on Section 106 resources.

### **Proposed Action**

Building 10 currently provides for material storage, office space, training space and as a support shop for mechanical work for rail fleet maintenance and upgrade. Building 10 was not built for these uses and the building configuration is not optimal for the functions it currently serves. The storage area is insufficient for current and future material and spare part storage. In the future, these functions will be relocated into new and expanded facilities to provide for enhanced safety and efficiency. In order to accommodate the future maintenance needs of the new M-8 fleet, the existing storage yard needs to be expanded and upgraded, including the installation of electrified tracks. This expansion is proposed to spread from the new Running Repair Shop to the Diesel Shop and requires the proposed demolition of Building 10 to provide for sufficient track capacity for the expanded fleet of rail cars. There are no other locations at NHRY that would be feasible for situating the storage yard expansion. An alternative to provide sufficient car storage on another location at the yard would require extensive reconfiguration of the historic track patterns and would be prohibitively expensive. As such, there are no prudent and feasible alternatives to the demolition of Building 10.

Consultation with SHPO determined that the demolition of Building 10 would be an adverse effect under NHPA. After negotiations with SHPO, it was agreed that SHPO would issue a conditional determination of no adverse effect if mitigation is implemented. The mitigation stipulated by SHPO was the historic documentation of the building to the professional standards of SHPO (see correspondence from SHPO dated November 28, 2006.) CTDOT submitted this documentation to SHPO (prepared by Fitzgerald & Halliday, Inc., April 2007.) The SHPO subsequently approved the documentation and, in its correspondence dated May 31, 2007, stated “This office believes the submitted materials are consistent with our documentation standards and succinctly record the historic and architectural aspects of the Stores Facility – Building 10” and “This office believes that CTDOT has satisfied the mitigative measures stipulated in our previous review, dated November 28, 2006, for the proposed undertaking.”

Because the mitigation required by SHPO for a determination of no adverse effect has been satisfied, the Proposed Action will have no adverse effects on historic resources.

## **15.3 MITIGATION**

The mitigation required by SHPO for a determination of no adverse effect has already been satisfied. In its correspondence dated May 31, 2007, SHPO stated “This office believes the submitted materials are consistent with our documentation standards and succinctly record the historic and architectural aspects of the Stores Facility – Building 10” and “This office believes that CTDOT has satisfied the mitigative measures stipulated in our previous review, dated

November 28, 2006 for the proposed undertaking.” Building 10 is not in the vicinity of the archaeologically sensitive roundhouse/turntable site, so archaeological monitoring is not warranted during demolition. No additional mitigation is required and none is proposed.

#### **15.4 SUMMARY OF IMPACTS**

The Proposed Action will have no adverse effects on Section 106 resources, which include historic, architectural, or archaeological resources listed on or eligible for the National Register.

#### **15.5 EMERGENCY DISCOVERIES**

The historic and archaeological resources at the NHRV have been comprehensively investigated and documented, as reported in this EA/EIE. The only archeologically sensitive resource within the bounds of the Proposed Action is the Spring Street turntable pit. Relic portions of the turntable, dating to 1869, remain buried in place. The turntable is located in the vicinity of the southwest corner of the proposed Independent Wheel True Shop (Locator Number 4 on Figure 3) and the proposed road and parking lot just west of that proposed shop. While construction of the road and parking lot is not anticipated to require excavations deep enough to disturb the relic pit, excavations for the foundations of the Independent Wheel True Shop could encroach upon it.

In order to protect the Spring Street turntable and any chance encounters of important historic resources, construction contractors will be held to specifications for the Protection of Archaeological and Paleontological Remains and Materials, as detailed in Section 1.10.06 of the CT DOT Standard Specifications for Roads, Bridges and Incidental Construction (Form 816, revised July 2008). These specifications will be written into construction documents and include the following provisions, among others:

- If archaeological or paleontological materials are uncovered, the contractor shall immediately halt operations in that location and will immediately notify CTDOT
- The contractor shall make every effort to preserve archaeological or paleontological materials intact in their original positions, in order to preserve the archaeological or paleontological nature and importance of such materials in relation to one another and to the enclosing soil.

In the event of such encounter of cultural materials, CTDOT will follow the following procedures:

- CTDOT will consult with FTA and SHPO to ensure appropriate treatment, which may entail evaluating, recording, and salvaging the archaeological or paleontological materials
- CTDOT will take steps to protect the site from vandalism and unauthorized investigations, from accidental damage and from dangers such as heavy rainfall or runoff.

In the event that human remains or grave-associated artifacts are encountered, construction will be halted and the discovered resources will be flagged or fenced-off to protect them from further construction-related impacts. CTDOT will act in accordance with the Policy Statement

Regarding Treatment of Burial Sites, Human Remains, and Funerary Objects of the Advisory Council on Historic Preservation and with applicable Connecticut state laws. In accordance with state laws, the Connecticut State Archaeologist will be informed immediately in the case of human remains. In the case of burial ground artifacts, the Connecticut Commission on Culture and Tourism will be consulted.



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## 16 SECTION 4(F) RESOURCES

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### 16.1 EXISTING SETTING

There are no publicly owned parks, recreation areas, and wildlife/waterfowl refuges located within the study area. However, the entire NHRY is considered to be eligible for inclusion in the National Register, and therefore is considered a historic Section 4(f) resource. As described in Chapter 15 and below, the NHRY was determined eligible as a complex of interrelated buildings and potential archaeological remains, and was recognized to have a mix of contributing and non-contributing resources.

#### *Historical Background and Significance*

The buildings in the New Haven Rail Yard are associated with southern New England's most important rail carrier of the late nineteenth and first half of the twentieth centuries, the New York, New Haven and Hartford Railroad. In addition to a near monopoly on freight in this heavily industrialized region, the railroad operated one of the busiest passenger services in the country. The buildings in the rail yard reflect operational support functions: building and repairing locomotives and freight cars, material storage, crew facilities, train control and central heating. Although sometimes overshadowed by other shop facilities, the New Haven yard played an important role throughout the railroad's long history.

This discussion is based on the 2006 Historic American Engineering Record documentation of the rail yard (HAER report). The yard was built by and for the New York & New Haven Railroad Company, one of the predecessors of the New York, New Haven & Hartford Railroad, which once operated the main freight and passenger lines in the Boston to New York corridor. The company was first chartered in 1844 and began operation in 1849, connecting the city of New Haven to New York's Harlem Railroad (HAER Report).

Construction of the yard began in 1868, when the New York & New Haven Railroad purchased twenty acres of low-lying land near New Haven harbor. The area was filled and graded prior to building of the first shops in 1869. The early buildings were constructed of brick and included a roundhouse and blacksmith, lumber, storage, paint and machine shops.

The New York, New Haven & Hartford Railroad Company (commonly known as the New Haven) was formed in 1872, when the New York to New Haven and the Hartford to New Haven Railroads were merged. The company grew rapidly in its early years through the acquisition of over 25 smaller railroad companies. The company's original lines, which measured 450 miles, measured 2,047 miles by 1900.

The New Haven initially ran single tracks throughout its system, but double tracking on the company's lines began in 1853. The increase to four tracks began in the 1887 and continued until the early 1900s. This increase to four tracks was part of an extensive plan that would eventually allow for the electrification of the main line system. The NY, NY & H Railroad began to

experiment with the electrification of a number of their smaller lines beginning in the early 1890s. Electric lines held the same appeal that they do for us today – they were clean and they were relatively safe (when compared to steam engines). The State of New York passed legislation in 1903 that forbade all steam trains from entering New York City after 1908 as a matter of public safety. In 1907, the first electrically powered train ran on the New Haven line from Grand Central Terminal to New Rochelle, New York. Around this same time the company opened two new shops at each end of the line in New York in Boston were built. These new additions along with a newly built freight facility at Cedar Hill in New Haven consigned the Lamberton Street Shops, or Lamberton Yard, as this rail yard area was known, to a secondary position.

J.P. Morgan gained control of the company around the turn of the century. He sought to create a monopoly on New England transportation. By using the New Haven Railroad as his monetary power base, he acquired hundreds of trolley and railroad lines and steamship companies. This string of acquisitions ended a decade later with the company close to financial collapse and Morgan in violation of a number of Federal Anti-Trust Laws.

During World War I, the federal government took control of the New Haven Railroad with United States Railroad Administration (USRA) taking control of operations. Under the USRA, the company regained stability. In the 1920s the New Haven expanded into the rubber tire transport area, creating a bus and trucking subsidiary known as “The New England Transportation Company.” The company weathered a series of highs and lows throughout the depression and WWII and resultant modernization programs of the late 1940s created one of the most modern passenger lines in the country.

The Lamberton shops in New Haven regained importance again in the 1920s after the line took on a fleet of gasoline powered self-propelled railcars as a cost-cutting measure. These cars were serviced and stored at the Lamberton Yard (HAER 8). During this same decade, over 12,000 boxcars were refurbished at the Lamberton Shops, another cost cutting measure that both helped the company forestall bankruptcy and saved the yards from imminent closure. The rebuilding program extended the life of the company’s rolling stock, which continued to be used through the Second World War. (HAER, Page 8)

The domestic rationing during World War II resulted in a cessation in physical improvements for the yard. All resources were funneled into maintenance of way and rolling stock to keep up with an increasing freight demand from the nation’s arsenals. Shortly following the war, the New Haven built a service building to service diesel engines in 1947 and Building 10 in 1948 (HAER p 9).

The new construction in the yard was even more utilitarian than the early buildings. Steel framing and truss systems provided a framework for solid concrete block structures, devoid of any ornament. These buildings were both more efficient and better equipped than the earlier structures, almost all of which were demolished during the second half of the twentieth century.

The great floods in 1955, the newly instituted interstate highway system and the southern migration of much of the area’s industry resulted in bankruptcy for the company in 1961. Finally, in 1969, the company was absorbed by the Pennsylvania Central Transportation

Company. Only three years later the Penn Central went bankrupt and the rail system was divided between two federally supported entities. Amtrak took control of all long haul passenger service beginning in 1971. ConRail took over operation of all freight and passenger commuter service when it was created in 1976. In 1983, Metro North, a company jointly owned by Connecticut and New York, assumed control of commuter rail traffic along the line.

The buildings in the New Haven Rail Yard are associated with southern New England's most important rail carrier of the late nineteenth and first half of the twentieth centuries, the New York, New Haven and Hartford Railroad. In addition to a near monopoly on freight in this heavily industrialized region, the railroad operated one of the busiest passenger services in the country. The buildings in the rail yard reflect operational support functions: building and repairing locomotives and freight cars, material storage, crew facilities, train control and central heating. Although sometimes overshadowed by other shop facilities, the New Haven yard played an important role throughout the railroad's long history. The rail yard is considered a National Register-eligible resource at the state and national levels. It is significant under Criterion A for its contribution to the development of the national transportation system 1869-1969 and a key link in the development of industry in New England. It is also significant under Criterion C in that the buildings and yard layout typify the large rail yards of the era 1869-1969.

The historic and archaeological resources at the NHRV have been comprehensively investigated and documented, as reported in this EA/EIE. The only archeologically sensitive resource within the bounds of the Proposed Action is the Spring Street turntable pit. Relic portions of the turntable, dating to 1869, remain buried in place. The turntable is located in the vicinity of the southwest corner of the proposed Independent Wheel True Shop (Locator Number 4 on Figure 3) and the proposed road and parking lot just west of that proposed shop. While construction of the road and parking lot is not anticipated to require excavations deep enough to disturb the relic pit, excavations for the foundations of the Independent Wheel True Shop could encroach upon it.

In order to protect the Spring Street turntable and any chance encounters of important historic resources, construction contractors will be held to specifications for the Protection of Archaeological and Paleontological Remains and Materials, as detailed in Section 1.10.06 of the CT DOT Standard Specifications for Roads, Bridges and Incidental Construction (Form 816, revised July 2008). These specifications will be written into construction documents and include the following provisions, among others:

- If archaeological or paleontological materials are uncovered, the contractor shall immediately halt operations in that location and will immediately notify CTDOT
- The contractor shall make every effort to preserve archaeological or paleontological materials intact in their original positions, in order to preserve the archaeological or paleontological nature and importance of such materials in relation to one another and to the enclosing soil.

In the event of such encounter of cultural materials, CTDOT will follow the following procedures:

- CTDOT will consult with FTA and SHPO to ensure appropriate treatment, which may entail evaluating, recording, and salvaging the archaeological or paleontological materials

- CTDOT will take steps to protect the site from vandalism and unauthorized investigations, from accidental damage and from dangers such as heavy rainfall or runoff.

In the event that human remains or grave-associated artifacts are encountered, construction will be halted and the discovered resources will be flagged or fenced-off to protect them from further construction-related impacts. CTDOT will act in accordance with the Policy Statement Regarding Treatment of Burial Sites, Human Remains, and Funerary Objects of the Advisory Council on Historic Preservation and with applicable Connecticut state laws. In accordance with state laws, the Connecticut State Archaeologist will be informed immediately in the case of human remains. In the case of burial ground artifacts, the Connecticut Commission on Culture and Tourism will be consulted.

Under Section 4(f), 23 CFR 774.11, if remains are found during construction, they will be subject to a Section 4(f) review at the time of discovery.

An adverse effect determination was made on project elements in 1998 that are included in this Proposed Action with the exception of Building 10. In 1998, an MOA was executed between the FTA, the Advisory Council on Historic Preservation, the Connecticut Department of Transportation and the Connecticut SHPO. This MOA included mitigation measures for all affected project elements. To date, all mitigation measures have been satisfied, including the project elements in this EA (again not including Building 10). At the time, Building 10 was not part of the proposed project under the MOA. These mitigations have been satisfied, particularly project elements in this current EA (again, not including Building 10)

Investigations for this EA/4(f) identified one contributing historic resource within the NHRV that will be affected by the improvements and that was not previously documented and mitigated. The proposed demolition of this resource was recognized as a potential Section 4(f) impact. This resource is the Stores Facility, also known as Building 10. Built in 1947, Building 10 was one of the long narrow structures in the area of the historic Lamberton Street Shops. As part of the shops complex, the building played a role in constructing and rebuilding the New Haven Railroad's rolling stock, which was critical to the railroad's success and longevity in the late 19<sup>th</sup> and early 20<sup>th</sup> Centuries. After World War One, over 12,000 boxcars were refurbished at the Lamberton Shops, a cost-cutting measure that helped the company forestall bankruptcy and saved the yard from imminent closure. It is a contributing component of the National Register-eligible rail yard. It is significant under Criterion A for its contribution to the development of the national transportation system 1869-1969 and a key link in the development of industry in New England. It is also significant under Criterion C in that the buildings and yard layout typify the large rail yards of the era 1869-1969.

## **16.2 DIRECT AND INDIRECT (CONSTRUCTIVE USE) IMPACTS ON SECTION 4(F) RESOURCES**

### **No-Build Alternative**

The No-Build Alternative would be a continuance of existing conditions such that no direct or indirect (Constructive Use) impacts to Section 4(f) resources would occur.

### **Proposed Action**

After reviewing the potential effects of the Proposed Action on Building 10, which entail demolition of the Building 10, SHPO issued a conditional determination of no adverse effect, meaning there would be no adverse effect if mitigation is implemented. The mitigation stipulated by SHPO was the historic documentation of the building to the professional standards of SHPO (see correspondence from SHPO dated November 28, 2006.) CTDOT submitted this documentation to SHPO (prepared by Fitzgerald & Halliday, Inc., April 2007.) In its correspondence dated May 31, 2007, SHPO stated “This office believes the submitted materials are consistent with our documentation standards and succinctly New Haven Rail Maintenance Facility EA/EIE Page 94 record the historic and architectural aspects of the Stores Facility – Building 10” and “This office believes that CTDOT has satisfied the mitigative measures stipulated in our previous review, dated November 28, 2006 for the proposed undertaking.”

Building 10 currently provides for material storage, office space, training space and as a support shop for mechanical work for rail fleet maintenance and upgrade. Building 10 was not built for these uses and the building configuration is not optimal for the functions it currently serves. The storage area is insufficient for current and future material and spare part storage. In the future, these functions will be relocated into new and expanded facilities to provide for enhanced safety and efficiency. In order to accommodate the future maintenance needs of the new M-8 fleet, the existing storage yard needs to be expanded and upgraded, including the installation of electrified tracks. This expansion is proposed to spread from the new Running Repair Shop to the Diesel Shop and requires the proposed demolition of Building 10 to provide for sufficient track capacity for the expanded fleet of rail cars. There are no other locations at NHRY that would be feasible for situating the storage yard expansion. An alternative to provide sufficient car storage on another location at the yard would require extensive reconfiguration of the historic track patterns and would be prohibitively expensive. As such, there are no prudent and feasible alternatives to the demolition of Building 10.

Because the mitigation required by SHPO for a determination of no adverse effect has been satisfied, the Proposed Action will have no adverse effects on historic resources. All appropriate planning action to minimize harm has been taken and all consultation has been completed. A Section 4(f) De Minimis Finding is therefore deemed appropriate for the Proposed Action. As described by the joint FTA-FHWA guidance memorandum on determining de minimis impacts (December 2005), de minimis impacts relative to historic sites are appropriate when a project has a Section 106 determination of no adverse effect or a determination of no historic properties affected. The Section 106 process has resulted in a determination of no adverse effect for the Proposed Action, indicating that de minimis applies. The FTA and CTDOT are therefore

requesting a Section 4(f) De Minimis Finding. Correspondence (letter dated April 29, 2008) documenting the Connecticut Department of Transportation de minimis impacts finding — and requesting FTA’s concurrence — is Appendix H of this EA/4(f).

Since there are no other Section 4(f) resources in the study area, the Proposed Action will not incur other Section 4(f) impacts.

### **16.3 MITIGATION**

The mitigation required by SHPO for a Section 106 determination of no adverse effect has already been satisfied. In its correspondence dated May 31, 2007, SHPO stated “This office believes the submitted materials are consistent with our documentation standards and succinctly New Haven Rail Maintenance Facility EA/EIE Page 94 record the historic and architectural aspects of the Stores Facility – Building 10” and “This office believes that CTDOT has satisfied the mitigative measures stipulated in our previous review, dated November 28, 2006 for the proposed undertaking.” Building 10 is not in the vicinity of the archaeologically sensitive roundhouse/turntable site, so archaeological monitoring is not warranted during demolition. A Section 4(f) De Minimis Finding has been prepared and is included in Appendix H. No additional mitigation under Section 4(f) is required and none is proposed.

### **16.4 SUMMARY OF IMPACTS**

The Proposed Action will have no adverse effect on Section 4(f) resources, which include historic, architectural, or archaeological resources listed on or eligible for the National Register.

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## 17 VISUAL/AESTHETIC EFFECTS

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### 17.1 EXISTING SETTING

The visual resource assessment area consists of the viewshed of the Proposed Action or essentially one block in any direction surrounding the Proposed Action site. This landscape is already dominated by the presence of the existing NHRY, the Union Station commuter rail buildings, and associated parking facilities. This facility as a whole creates a visual resource area comprised of tracks, pavement, platforms, and rooftops. The NHRY and Union Station are surrounded by a highly urbanized mix of land uses, including residential units (apartment buildings, single- and multi-family houses), office buildings, shops, parking garages and surface parking lots, and industrial sites, all of various materials, sizes, styles, and colors. To the north, is the elevated Route 34 connector to I-95. There is also a new bridge that extends Church Street over the NHRY to the Long Wharf area. This Church Street South bridge bisects the NHRY. Vegetation on the Proposed Action site is sparse and includes a small wetland area in the center of the rail yard. There are also single or small clusters of trees, shrubs, and strips of lawn alongside buildings or roadsides and within neighborhoods surrounding the Proposed Action site. These add little visual texture and interest to an otherwise urban landscape.

There are no visual/aesthetic highlights within the Proposed Action site that stand out against an otherwise urban backdrop. Views to and from the site generally feature buildings of various architectural styles and modifications, roadways with traffic signals, utility poles and lines, chain link fencing, pavement associated with roadways, and the railroad tracks. The frequent movement of passenger trains through the Proposed Action area is seen and heard from surrounding vantage points.

There is a residential cluster, comprised of the Church Street South Apartments and Robert T. Wolfe Apartment Building, to the northwest of the Proposed Action site. The Hill neighborhood borders the Proposed Action site on the west, with several residential streets within view of the site, including Union Avenue, Cedar Street, and Hallock Street.



Hallock Street neighborhood (looking north). New Haven Rail yard is to the east.

## **17.2 DIRECT AND INDIRECT IMPACTS ON VISUAL/AESTHETIC RESOURCES**

### **No-Build Alternative**

The No-Build Alternative would be a continuance of existing conditions, and, as such, would not impact the existing visual and aesthetic characteristics of the Proposed Action study area.

### **Proposed Action**

The existing visual environment is a rail yard, and, with the Proposed Action, the setting will remain a rail yard. There will be no adverse visual/aesthetic impacts. The location, height, massing, configuration, and architectural detail of individual elements of the Proposed Action will be compatible with each other, and, to the extent possible, with the surrounding area.

The appearance of the rail yard to those familiar with it may change slightly with the construction of new buildings, addition of more stored rail cars, and the demolition of the uniquely shaped water treatment facility known as the “Onion.” This facility will be used during the construction period, and then demolished. There will be no major visual impacts from the Proposed Action.

### **17.3 MITIGATION**

Because the Proposed Action will have no adverse impacts on the visual and aesthetic appearance of the site, mitigation is not required or proposed.

### **17.4 SUMMARY OF IMPACTS**

The Proposed Action will not result in any adverse impacts to the Visual and Aesthetic quality of the study area.



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## **18 CRITICAL ENVIRONMENTAL AREAS AND ENDANGERED SPECIES**

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### **18.1 EXISTING SETTING**

The Proposed Action site is an existing active rail yard, surrounded by an urban area in New Haven. The site primarily contains railroad tracks, platforms, pavement, and buildings. It is largely devoid of vegetation, and, therefore, provides very limited wildlife habitat.

The U.S. Fish and Wildlife Service (USFWS) and the CTDEP Environmental and Geographic Information Center Natural Diversity Database (NDDDB) were consulted to determine if any state or federal threatened, endangered or special concern species or critical habitats are known to occur on the site. A response dated November 27, 2006 from the USFWS (in Appendix A) states that “based on information currently available to us, no federally-listed or proposed, threatened or endangered species or critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the Proposed Action area.”

A response dated December 1, 2006 from the CTDEP (see Appendix A) states that, according to the CTDEP’s Natural Diversity Database, a threatened species, American kestrel (*Falco sparverius*) occurs in the vicinity of this Proposed Action site. American kestrels nest in late March–April in open areas like wooded edges, parks, and open field habitat. They are cavity nesters and seek out abandoned woodpecker or flicker holes to nest. However, no such habitat exists on the developed Proposed Action site. Correspondence received from the CTDEP on April 12, 2007, states “If your project is to occur within the existing developed New Haven Rail Maintenance Facility in New Haven and will not affect any undeveloped land then the work will not be done in any American kestrel habitat. Please proceed with the project.”

### **18.2 DIRECT AND INDIRECT IMPACTS ON CRITICAL ENVIRONMENTAL AREAS AND ENDANGERED SPECIES**

#### **No-Build Alternative**

The No-Build Alternative will maintain the Proposed Action study area in its present condition and therefore will not have an impact on wildlife, ecologically sensitive areas, or threatened and endangered species.

#### **Proposed Action**

The NHRY is developed with tracks, platforms, pavement, and buildings, and, is, for the most part, devoid of vegetation. There is no suitable habitat, such as trees with cavities, that would provide nesting areas for the American kestrel. Therefore, impacts on this threatened species are unlikely.

### **18.3 MITIGATION**

The Proposed Action is not likely to have impacts on the American kestrel, a threatened species. There are no trees with cavities on the site (the preferred habitat for nesting kestrels). Since impacts are unlikely, mitigation is not required.

### **18.4 SUMMARY OF IMPACTS**

The Proposed Action is not likely to have impacts on the habitat of the American kestrel, a threatened species observed in the vicinity of the NHRY site.

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## 19 WATER RESOURCES AND WATER QUALITY

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### 19.1 EXISTING CONDITIONS

#### Surface Water

There are no watercourses within or immediately adjacent to the NHRV site. The nearest surface water resource is New Haven Harbor, located over 2300 feet to the east of the rail yard.

#### Groundwater

Groundwater quality in the area of the NHRV and surrounding vicinity is classified as “GB” (CT DEP, 2003). Groundwater designated by the CTDEP as Class GB is assumed to be degraded due to a variety of pollution sources and is assumed unsuitable for human consumption without treatment. Such waters are usually within a highly urbanized and/or industrial area and where public water supply service is available. GB-designated uses include industrial process water and cooling waters, and base flow for hydraulically connected surface water bodies.

#### Stormwater

The majority of the project site consists of gravel, ballast and unpaved areas. With the Proposed Action, there will be a net increase of impervious surface, which includes paved areas, rooftops, and parking areas.

Currently, the drainage system for the site runs along the perimeter of the rail yard. There are two major drainage lines and one force main that collect storm flow:

- A 12-foot by 4-foot culvert in Church Street Extension South
- Twin 6-foot by 6-foot box culverts that discharge at Canal Dock Road
- Lined 42-inch force main extending from the east end of the site beneath Route 34 out to New Haven Harbor

These drainage lines ultimately discharge to New Haven Harbor.

There are several drainage challenges associated with the site including its flat topography and proximity to Long Island Sound. Other drainage challenges include the density of the proposed site plan, high groundwater elevation, and the presence of contaminated soils. There are also subsurface facilities, such as tanks.

## **19.2 DIRECT AND INDIRECT IMPACTS ON WATER RESOURCES AND WATER QUALITY**

### **No-Build Alternative**

The No-Build Alternative will maintain the site of the NHRY in its present condition. The No-Build Alternative will, therefore, have no direct or indirect impacts to surface and/or groundwater resources or the quality of those resources.

### **Proposed Action**

Some of the existing site is already impervious and used for the existing rail yard, including maintenance and storage facilities, shops, pavement, buildings, platforms, and other rail yard related uses. There will be a net increase of impervious surface as a result of the Proposed Action.

On-site detention/retention of stormwater is not feasible due to the density of the proposed site plan, high groundwater elevation, and the presence of contaminated soils. Subsurface facilities, such as tanks, would require costly excavation and removal of contaminated soils. A Stormwater Management Plan will be prepared for the site, which will improve stormwater quality over existing conditions.

Two shop buildings (S&I and component change-out) are planned for the area where the main drainage lines are located. One of the drainage lines will be reconstructed on a new alignment and the other will be protected in place.

The proposed site Stormwater Management Plan will employ various methods to address stormwater quality. In track areas, infiltration through the ballast will remain the primary means of handling stormwater. Paved walkways between tracks will also be designed to drain to the ballast. The ballast will act as filtration media. Catch basins at low points, surrounded by at least a 25' radius of porous material (ballast) without overland outlets, will be provided. Underdrains will be installed above contaminated soil and groundwater, will have appropriate filter fabric and stone bedding material, and will act to relieve overflow to the ground water table. For new buildings, roof drains will be piped directly to the existing stormwater system. In limited areas, such as the loading dock and visitor parking for the component changeout shop, it will not be possible to avoid installing several catch basins directly in pavement. The effluent from these structures will be directed through hydrodynamic separators prior to discharge to the offsite drainage system. During storm events, stormwater will be conveyed via sheet flow across ballasted areas which will filter the stormwater, then into underdrains that will tie into New Haven's existing stormwater sewer collection system and discharged, ultimately, into New Haven Harbor, as under present conditions. In addition, to shield the rail yard and its associated facilities from backwater flow, backflow preventors (tidal flex valves) will be installed at all connection points between rail yard drainage systems and offsite drainage systems.

Prior to construction, erosion and sedimentation control devices will be installed. During construction, dewatering wastewater will be collected and removed to an approved off-site facility. Best Management Practices such as anti-tracking pads, dust control measures, silt fencing, and catch basin protection will be employed, inspected and maintained in accordance with CTDOT Standard Specifications (Form 816).

In addition to stormwater runoff, other waste water streams are generated by the EMU shop, which has an existing filtration plant, currently off-line. The EMU shop's filtration system will be displaced by the new track layout. A new system is proposed for the EMU shop. Discharges will go into holding tanks which will be pumped out and the contents disposed of at an off-site facility.

In general, each new building will have its own system to collect and store the wastewater stream. The effluent from each storage tank, will be tested for contaminants, and then properly disposed of off-site.

Drip pans will be used to collect chemical effluents from the car wash facility and transported off-site for proper disposal.

Drip pans will also be installed beneath the designated parking spots for diesel locomotives in the storage yards. Storm water collected from these drip pans will be processed by oil/water separators and then discharged to the storm drain system.

Sewage from the buildings and toilet manifold systems will be discharged to the sanitary sewer system in the vicinity of Church Street.

All underground storage tanks will be registered with the CT DEP.

### **19.3 MITIGATION**

To mitigate potential surface water quality degradation, both during construction and post-construction, a stormwater pollution control plan will be designed and implemented in accordance with the 2002 Connecticut Guidelines for Erosion and Sedimentation Control (CT DEP, 2002). The measures taken will prevent and minimize sedimentation, siltation, and/or pollution of watercourses and off-site wetlands. Temporary and permanent stormwater management facilities will be appropriately designed in conformance with the Connecticut Stormwater Quality Manual (CT DEP, 2004). Because the project is within, and affects, the 100 year floodplain, the project will require flood management certification pursuant to section 25-68d of the CGS. In addition, a general permit for stormwater discharge during construction will be required from CT DEP, since more than one acre will be disturbed. The following specific measures will be taken to mitigate impacts to water quality:

- Ensuring that water services are equipped with water meters and backflow preventers
- Employing a water recycling system in the car wash facility
- Providing chemical neutralizing tanks and PH treatments as required
- Installing industrial waste drainage systems, associated sand interceptors, oil/water separators, and sewage ejector systems as required.

### **19.4 SUMMARY OF IMPACTS**

The Proposed Action will not result in a decrease in water quality.



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## 20 WETLANDS

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### 20.1 EXISTING CONDITIONS

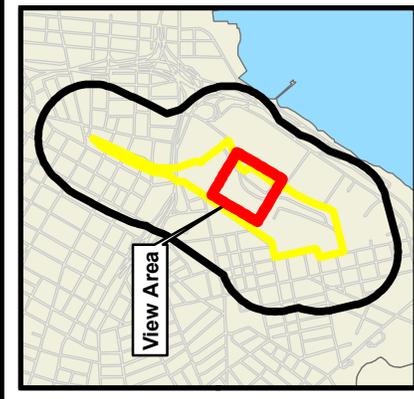
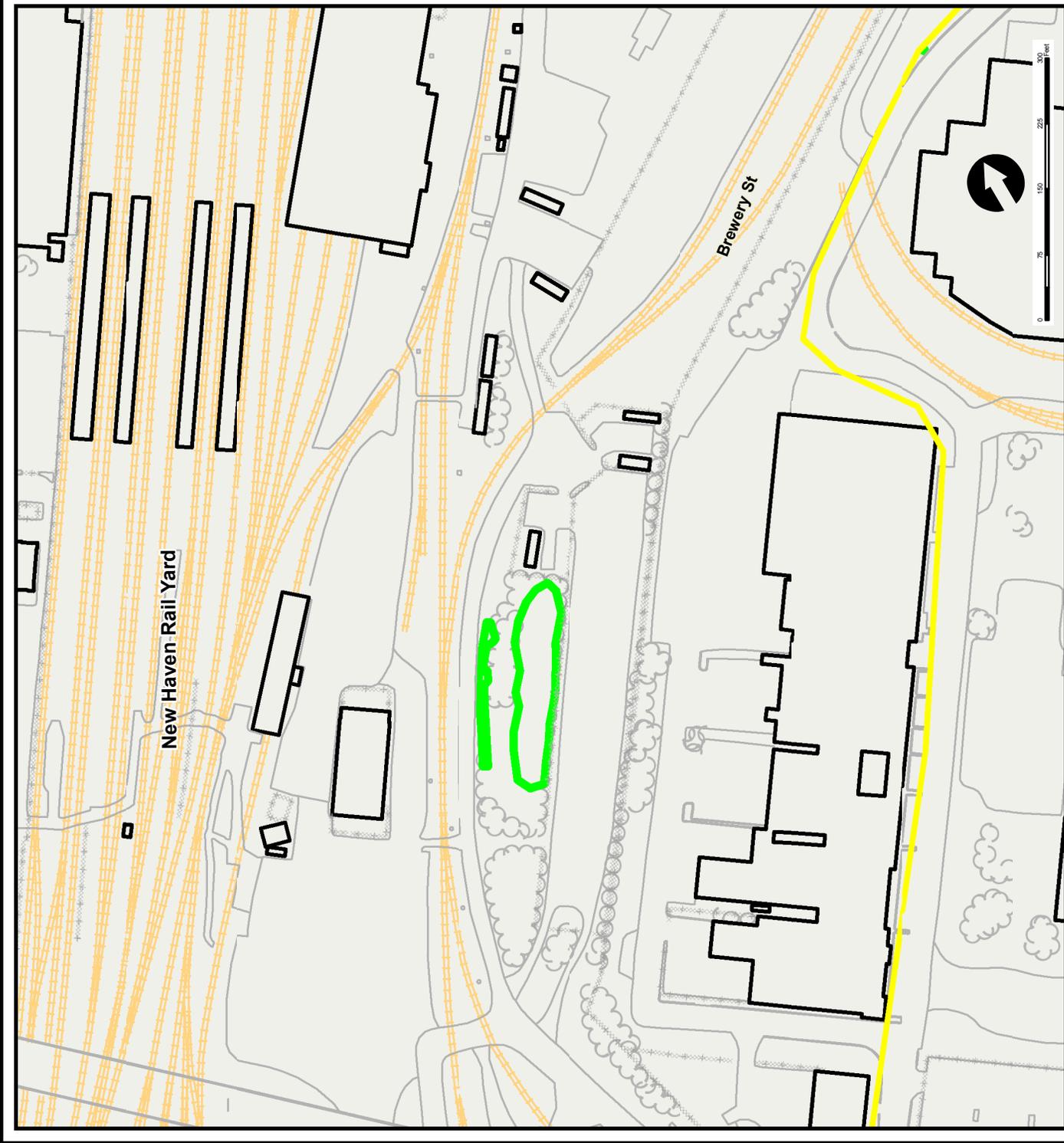
Wetlands can generally be defined as areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support and that, under normal circumstances, do support a prevalence of vegetation typically adapted for life in saturated soil conditions.

Wetlands in the vicinity of the Proposed Action were field delineated by a registered soil scientist (Connecticut Ecosystems, LLC) on October, 3, 2006. Wetland boundaries were delineated based on both the U.S. Army Corps of Engineers (USACE) 1987 *Wetland Delineation Manual* and State of Connecticut wetlands (soils) definition. Subsequent coordination with the US Army Corps of Engineers resulted in the determination that these wetlands are state-regulated only, and that since there is no direct connection to a watercourse or waterbody, the Corps would not take jurisdiction. Wetland flags were surveyed and wetland boundaries were mapped on Proposed Action plans (see Figure 11). Wetlands functions and values were further identified during a site visit on March 22, 2007.

The delineation identified inland wetlands in the center of the rail yard, generally north of Church Street Extension and west of the food terminal area. The impacted wetlands cover a total of 10,130 SF (0.232 acres). One wetland covers 1,050 SF (0.024 acres) and another covers 9,080 SF (0.208 acres). The wetlands are separated from each other by a fill berm/mound. Overland drainage from the rail yard and surrounding urban development collects in these low wetland areas. The impacted wetlands in this drainage swale were once part of a larger, now historical, wetland.

The marsh wetlands are temporarily flooded and comprised of poorly drained glacial till. The wetland soils are consistent with a landscape subject to prior filling and/or excavation. The wetland soil types at this location are Aquents (disturbed wetland soils) and Urban Land (an upland, non-wetland soil type), intermingled with small areas of Udorthents (urban land complexes, often formerly excavated areas comprised of fill material). Common reed (*Phragmites australis*) dominates the emergent, largely invasive herbaceous vegetation. The wetlands are essentially a uniform stand of *Phragmites*.

Due to their small size and proximity to Connecticut's largest and most active commuter rail yard, the wetland areas have limited value, with their primary function being to trap sediments/toxicants. Because the wetlands are located within the existing rail yard, wildlife would find it difficult to access, and because of their small size and lack of vegetative diversity, migratory birds would not likely be attracted to them. Ecological functions, including wildlife habitat, are essentially absent, although the wetlands do provide for some ground water recharge. The small size of the wetlands limits their flood storage capacity.



-  Buildings
-  Fences
-  Roads
-  Treeline
-  Delineated Wetlands
-  Tracks
-  Rail Yard Property
-  Study Area

**Figure 11**  
**Wetlands**  
 New Haven Rail Yard EA/EIE  
 New Haven, CT  
 State Project # 301-0088



The USACE has determined and conveyed in correspondence dated May 2007 (Appendix A) that each wetland is isolated, with no defined inlet or outlet. The wetlands are not hydrologically connected to any other wetland areas, and there are no adjacent, bordering, contiguous, or neighboring waters or wetlands at the site. Degradation or loss of these wetlands will not affect other waters of the U.S. According to a Memorandum for the Record (May 31, 2007), the USACE has found that “this wetland should not be considered a water of the United States and there are no other jurisdictional waters or wetlands on the site.”

An Inland Wetlands Permit was received from the State of Connecticut Department of Environmental Protection on January 14, 2008.

## **20.2 DIRECT AND INDIRECT IMPACTS ON WETLANDS**

### **No-Build Alternative**

The No-Build Alternative will not alter the existing condition of the Proposed Action study area, and therefore will not result in any direct or indirect wetland impacts.

### **Proposed Action**

Under the Proposed Action, the two inland wetlands located on site will be filled in order to construct the new S&I shop, wheel truer, and additional track. Thus, 10,130 SF (0.232 acres) of wetland will be permanently impacted with a corresponding loss of its primary function, which is to trap and remove sediments and toxicants contained in stormwater runoff. Due to this impact, the Proposed Action will require a Connecticut Department of Environmental Protection Inland Wetlands Permit. There are no other direct or indirect wetland impacts associated with the Proposed Action.

## **20.3 MITIGATION**

No direct replacement wetland mitigation is proposed as mitigation; however, the improvements to the storm drainage system will improve water quality discharged from the site, and will serve as mitigation to replace the lost function and value of the wetland to be filled.

## **20.4 SUMMARY OF IMPACTS**

The Proposed Action will result in permanent impact to 10,130 SF (0.232 acres) of wetlands, with a corresponding loss of their primary function, which is to trap and remove sediments and toxicants contained in stormwater runoff. They also provide some flood storage capacity, although their capacity is limited due to their small size. These functions will be lost with the filling of the wetlands.



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## 21 FLOODPLAINS AND STREAM CHANNEL ENCROACHMENT LINES

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### 21.1 EXISTING SETTING

According to the *Flood Insurance Study* (December 1976) and the *Flood Insurance Rate Map* for the City of New Haven, Connecticut, New Haven County (Federal Emergency Management Administration, revised October 31, 1997), the Proposed Action encroaches upon the 100-year floodplain (see Figure 12) along the eastern portion of the site. The Proposed Action also encroaches upon the 500-year floodplain in the western portion of the rail yard. These coastal floodplains are associated with New Haven Harbor/Long Island Sound. The Proposed Action also lies within Connecticut's Coastal Boundary (see also Chapter 23 of this document) and its associated coastal flood hazard area (CFHA).

Flood waters from New Haven Harbor reach the rail yard from two openings in the I-95 embankment at Canal Dock Road and Long Wharf Drive, as well as by backflow through the existing stormwater drainage system.

There are no Stream Channel Encroachment Lines (SCEs) in the vicinity of the Proposed Action site.

### 21.2 DIRECT AND INDIRECT IMPACT ON FLOODPLAINS

#### **No-Build Alternative**

The No-Build Alternative will maintain the area in its present condition, and, therefore, will have no impacts to the 100-year floodplain resources.

#### **Proposed Action**

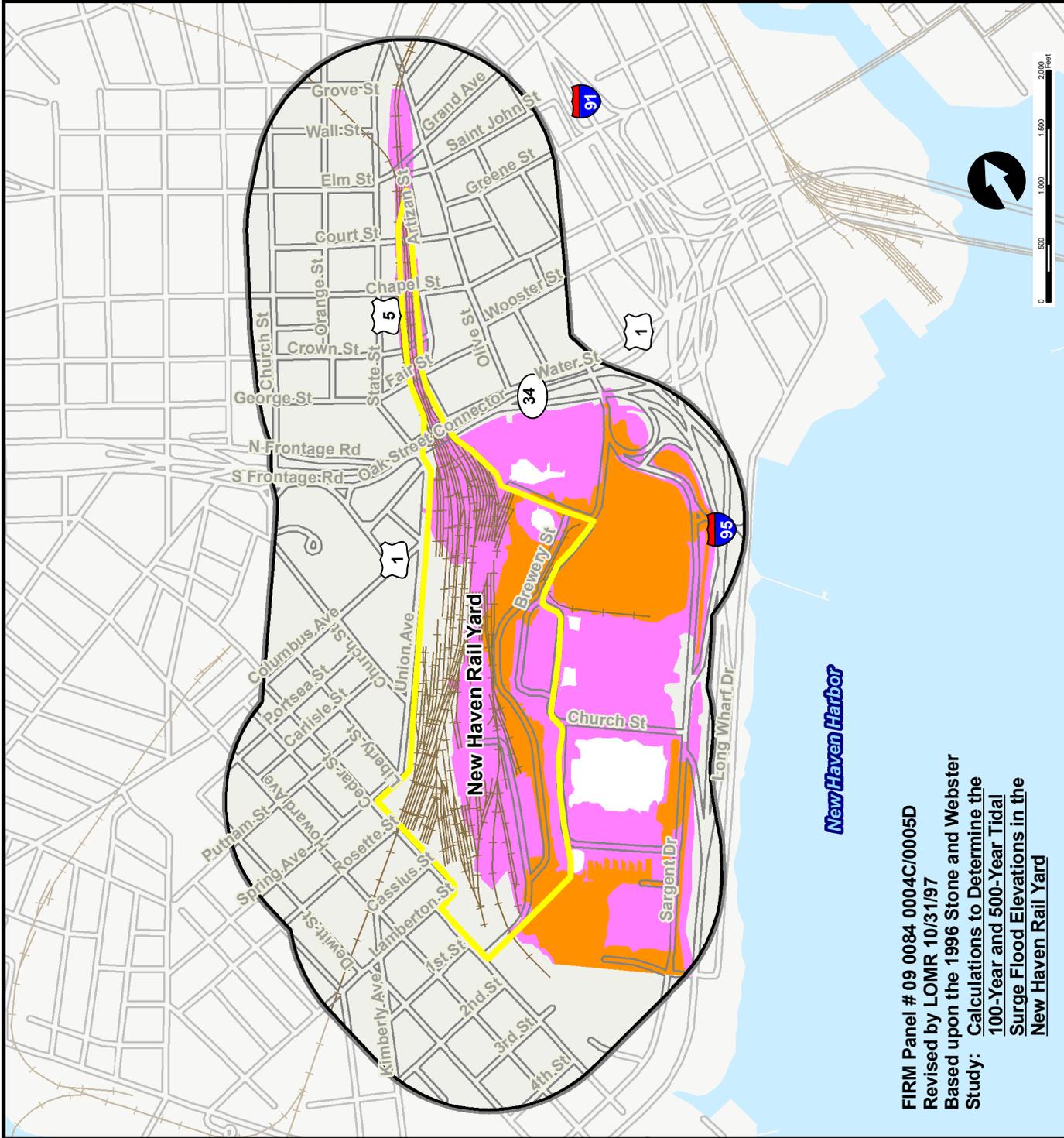
The Proposed Action is considered an "activity" per CGS Section 25-68b (1) of Connecticut's Flood Management Statutes and is subject to the 100-year floodplain requirements. Additionally, the Proposed Action is subject to Executive Order 11988, as amended, which requires all federal agencies to avoid construction within the 100-year floodplain unless no other practical alternative exists. The Proposed Action encroaches upon the 100-year floodplain.

The Proposed Action also lies within Connecticut's coastal flood hazard area, and a Connecticut Department of Environmental Protection Coastal Consistency Review will be required for the Proposed Action, in compliance with the Connecticut Coastal Management Act. It is anticipated that the review will determine that there will be some impacts to the CFHA (see also Chapter 23 of this document on Wild and Scenic Rivers, Navigable Waterways, and Coastal Resources for discussion of impacts to the coastal floodplain.)



**Figure 12  
FEMA Floodplains**  
New Haven Rail Yard EA/EIE  
New Haven, CT  
State Project # 301-0088

- Roads
- Rail
- Rail Yard Property
- Study Area
- Open Water
- Surveyed Floodplains**
  - 100 Year Flood Zone
  - 500 Year Flood Zone



**New Haven Harbor**

FIRM Panel # 09 0084 0004C/0005D  
 Revised by LOMR 10/31/97  
 Based upon the 1996 Stone and Webster  
 Study: Calculations to Determine the  
 100-Year and 500-Year Tidal  
 Surge Flood Elevations in the  
 New Haven Rail Yard

Since there are no SCELs in the vicinity of the Proposed Action site, neither the No-Build Alternative nor the Build Alternative will have any impact.

### **21.3 MITIGATION**

As the Proposed Action is a non-residential “critical activity,” the floor level of structures built within the 100-year floodplain must be raised to the elevation of the 500-year floodplain of 10.4 feet NGVD 1929. In addition, all utilities (i.e., water, sewer, floor drains, man-holes, piping) are to be flood-proofed to the base flood elevation to prevent back-water flow. Facilities used for outdoor storage of hazardous and/or flammable materials are also to be set above the 500-year floodplain level. The Proposed Action is also within the expansive coastal flood hazard area, which extends along the entire Connecticut’s coastline.

The Proposed Action will result in a minimal loss of flood storage capacity, but due to the size of the large coastal floodplain, this impact will be negligible. (See also Chapter 23 of this document on Wild and Scenic Rivers, Navigable Waterways, and Coastal Resources for discussion of mitigation of impacts to the coastal floodplain.)

### **21.4 SUMMARY OF IMPACTS**

The Proposed Action site encroaches on the 100-year floodplain zone. Due to the size of the large coastal floodplain, this impact will be negligible.



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## 22 FARMLANDS

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### 22.1 EXISTING SETTING

The northwestern portion of the NHRY was originally uplands, while the southeastern portion was tidal lands. Since the nineteenth century, the land has been greatly modified. The mud flats that once comprised the New Haven Harbor shoreline have been filled in over several decades to support development and transportation uses.

Today, the Proposed Action site is urbanized and covered, generally, by railroad tracks and impervious surfaces (i.e., pavement, buildings, rail platforms, roof tops). According to the *Soil Survey Geographic Database for the State of Connecticut 2000–2005* (U.S. Department of Agriculture, Natural Resources Conservation Service, 2005) and the CTDEP, soils at the site consist primarily of Aquents (disturbed wetland soils) and Urban Land (an upland, non-wetland soil type), intermingled with small areas of Udorthents (urban land complexes, often formerly excavated areas comprised of fill material). These soils have been altered by cutting, filling, or grading. Such areas have either had two feet or more of the upper part of the original soil removed or have more than two feet of fill material on top of the original soil. Soils at the Proposed Action site are not farmland soils, and there are no prime or other statewide important farmland soils or active farmland in the vicinity of the Proposed Action.

### 22.2 DIRECT AND INDIRECT IMPACTS ON FARMLANDS

#### **No-Build Alternative**

The No-Build Alternative will maintain the area in its present condition, and, therefore, will have no impacts to active farms or farmland soils.

#### **Proposed Action**

The Proposed Action will not have any direct or indirect impact to active farms or to prime or other statewide important farmland soils.

### 22.3 MITIGATION

Since the Proposed Action will have no effect on farmland soils, mitigation is not required or proposed.

### 22.4 SUMMARY OF IMPACTS

The Proposed Action will not result in any adverse impacts to Active Farms or Farmland Soils.



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## 23 WILD AND SCENIC RIVERS, NAVIGABLE WATERWAYS, AND COASTAL RESOURCES

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### 23.1 EXISTING SETTING

#### Wild and Scenic Rivers

None of the watercourses within the region of the NHRY are included in the National Wild and Scenic Rivers System or are currently under study/consideration for designation to the National Wild and Scenic Rivers System.

#### Navigable Waterways

There are no navigable waterways within the NHRY site.

#### Coastal Resources

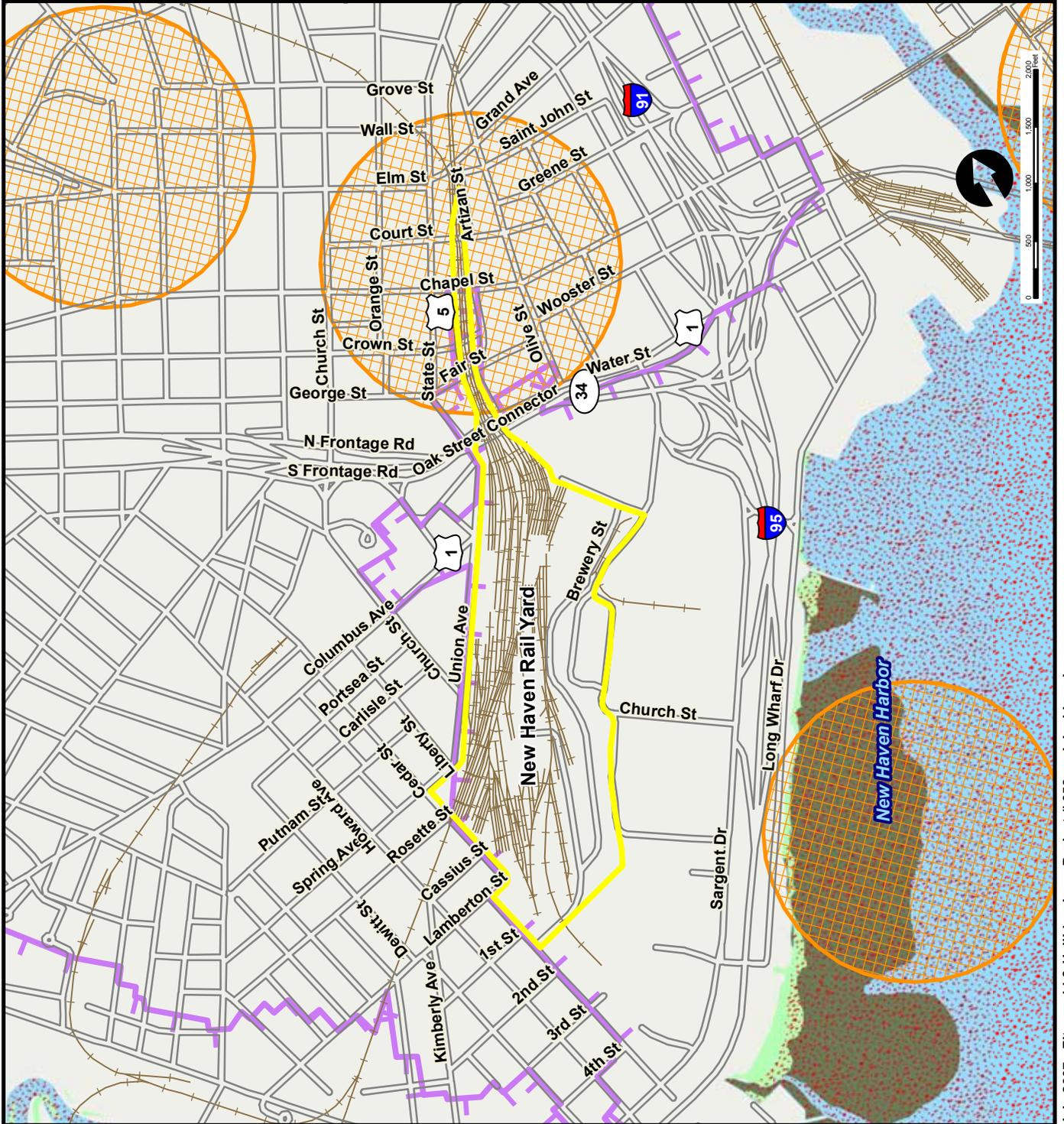
The NHRY site lies within Connecticut's designated Coastal Boundary, as defined by the Connecticut Coastal Management Act (CCMA) (see also Chapter 21, Floodplains). Coastal resources at this location include coastal flood hazard areas associated with New Haven Harbor and Long Island Sound (Figure 13). The NHRY site is entirely within the coastal flood hazard area (CFHA). The easternmost part of the NHRY site is within a Category 1 and 2 Hurricane Surge Area, while a band through the center of the site is within a Category 3 Hurricane Surge Area, and the westernmost part of the site is within a Category 4 Hurricane Surge Area (CTDEP, *Environmental GIS Data for Connecticut*, Environmental & Geographic Information Center, 2006).

According to the Connecticut General Statutes [CGS section 22a-93(7)(H)], coastal flood hazard areas are "those land areas inundated during coastal storm events or subject to erosion induced by such events, including flood hazard areas as defined and determined by the National Flood Insurance Act and all erosion hazard areas as determined by the Commissioner (of the CTDEP). In general, coastal flood hazard areas include all areas designated within the A-zone and V-zones by FEMA."

There are two primary coastal flood hazard area policies under CCMA. One is "to manage coastal hazard areas to insure that development proceeds in such a manner that hazards to life and property are minimized" and the other is "to maintain the natural relationship between eroding and depositional coastal landforms; to minimize the adverse impacts of erosion and sedimentation on coastal land uses through the promotion of nonstructural mitigation measures."



**Figure 13**  
**Coastal Resources**  
 New Haven Rail Yard EA/EIE  
 New Haven, CT  
 State Project # 301-0088



The Long Wharf and City Point areas surrounding the NHRY are prone to flooding during storm events, according to the *City of New Haven's Natural Hazard Mitigation Plan (2005)*.

There are also freshwater wetlands on the NHRY site (see Chapter 20, Wetlands).

## **23.2 DIRECT AND INDIRECT IMPACTS ON WILD AND SCENIC RIVERS, NAVIGABLE WATERWAYS, AND COASTAL RESOURCES**

### **No-Build Alternative**

The No-Build Alternative will maintain the area in its present condition and, therefore, will have no impacts on wild and scenic rivers, navigable waterways, or coastal resources.

### **Proposed Action**

#### Wild and Scenic Rivers

The Proposed Action will not have any direct or indirect impact to wild and scenic rivers as these resources do not exist in the NHRY area.

#### Navigable Waterways

The Proposed Action will not have any direct or indirect impact to navigable waterways as these resources do not exist in the NHRY area.

#### Coastal Resources

The NHRY lies entirely within the CFHA. The CFHA is associated with New Haven Harbor and Long Island Sound. The CFHA is expansive and extends along the entire coast of Connecticut; therefore, the Proposed Action affects only a small portion of the overall CFHA.

The Long Wharf and City Point areas surrounding the NHRY are prone to flooding during storm events, according to the *City of New Haven's Natural Hazard Mitigation Plan (2005)*. Although the Proposed Action will result in a loss of flood storage capacity, flooding patterns are not expected to be substantially affected as topographic modifications within the CFHA will be negligible to the large coastal floodplain.

## **23.3 MITIGATION**

Since there are no adverse impacts to wild and scenic rivers or navigable waterways, no mitigation is required or proposed for these resources.

A Connecticut Department of Environmental Protection coastal consistency review will be required for the Proposed Action, in compliance with the Connecticut Coastal Management Act.

#### **23.4 SUMMARY OF IMPACTS**

The Proposed Action will not result in any adverse impacts to Wild and Scenic Rivers or Navigable Waterway, as these resources do not exist in the area. There will be impacts to the coastal flood hazard area.

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## 24 PUBLIC UTILITIES AND SERVICES

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### 24.1 EXISTING SETTING

#### Electric

United Illuminating (UI) is the sole supplier of electrical power to the rail yard, including the overhead catenary and feeder wires. Both overhead and underground power lines run along perimeter streets. Substations providing power to the site are found on Hallock Street, Union Avenue and Church Street South. Electric power is fed to the rail yard, individual buildings, pump stations, yard lights, and other facilities. A UI pole line runs within an easement along Brewery Street on the eastern edge of the site.

#### Communications

AT&T provides telephone service to the NHRY site. From Hallock Street, a conventional overhead and underground cable system feeds the various buildings on site. AT&T has a subsurface line beneath, as well as an aerial line, on the UI pole line within the easement along Brewery Street on the eastern edge of the site. CTDOT also owns a fiber optic cable that runs from Union Station, west, around the perimeter of the rail yard.

#### Gas

Southern Connecticut Gas Company provides natural gas to the NHRY site. One line runs from the south side of the rail yard in the vicinity of the east side of the Church Street overpass north to the former Amtrak power plant, where the line branches to feed various other buildings. Portions of the gas line network appear to have been abandoned and capped. A second line enters the rail yard from the south through an easement and travels north to the existing EMU Shop and west to the existing Wheel True Building.

There is also a large propane tank on the southern side of the NHRY site, with lines running northwest and dead-ending at the Union Station platforms and a former Guard Shack location.

#### Water

Public water, provided by the South Central Regional Water Authority, comes from three locations, one at Hallock Street, one on Long Wharf Street, and one under the Church Street Bridge at the south abutment. From Hallock Street, a water line runs into the rail yard and provides water to the Transportation Building and MU Yard. From Church Street, a water line runs into the rail yard and provides water to the Diesel and Car Shop and connects to a yard network, serving Building 10, the EMU Building, the Support Shop, and the Blow Shed. The Long Wharf Street water line enters the site from the east. There are several “dead-end” and capped water lines on the site.

## Sewer

Floor drain effluents from the EMU shop, which formerly discharged to the sanitary sewer, are now collected in 30,000 gallon tanks and disposed of off-site. In general, new buildings will have their own systems.

There are a total of three pump stations in the rail yard. One is located at the west end (inside the loop track), one at the east end (adjacent to the EMU Shop), and one in the middle of the yard. There is a temporary force main to Hallock Street which is used only for dewatering effluent. This connection to New Haven's combined sewer system will be removed. All permanent sewer flow will be routed to the Church Street connection, a separated system which ties into the Sargent Drive trunk line.

## **24.2 DIRECT AND INDIRECT IMPACTS ON PUBLIC UTILITIES AND SERVICES**

### **No-Build Alternative**

The No-Build Alternative would maintain the area in its present condition, and, therefore, would not result in any direct or indirect utility impacts.

### **Proposed Action**

Construction of the Proposed Action will involve site work that could result in some utility service disruptions for nearby customers. Some of the existing utility infrastructure will need to be relocated and/or replaced to accommodate the new facilities and associated improvements. More specific impacts are described below.

### Electrical

The overhead catenary two-wire system will be designed in accordance with the National Electrical Safety Code, American Railway Engineering and Maintenance Manual, and MNR standards. The proposed catenary system will be integrated with the existing yard and mainline systems to ensure compatibility. Foundations and poles for the new system will be appropriately spaced. The existing electrical supply system will be upgraded. Existing buildings will be hooked-up to the modified electric distribution system. Transformers and associated equipment for eliminated buildings will be removed. The Proposed Action will require the removal and relocation of many utility and light poles, and new buildings will require feeds. The UI pole line along Brewery Street will be relocated to the opposite side of Brewery Street to provide space for construction of the component change-out facility. In addition, a new UI feeder will be routed to the yard to address the proposed increase in electrical loads due to the new facilities.

### Communications

The Proposed Action will include establishing a new communications hub at the component repair shop (to replace the existing one at the EMU shop). The new communications hub will be connected to all new and existing facilities. The subsurface and aerial AT& T lines that run in

the easement along Brewery Street will be rerouted on the pole line on the opposite side of Brewery Street.

### Gas

The gas line running north from Church Street falls under the footprint of the proposed shops and will need to be relocated. The propane tank on the southern side of the NHRY will be removed.

### Water

Construction of the proposed wheel true facility, the S&I shop, and the component change-out facility will require relocation of water mains. It is anticipated that only the water lines in the areas of the proposed buildings will require relocation.

### Sewer

The existing filtration plant for the EMU shop, currently off-line, will be displaced by the new track layout. A new ultra-separation/filtration plant is proposed for the EMU shop. Discharges will either go into holding tanks which will be pumped out and contents disposed of at an off-site facility, or will be treated and ultimately discharged to the sanitary sewer system.

In general, each new building will have its own system to collect and store wastewater streams. The effluent will be pumped to separate storage tanks. Tank contents will be tested for contaminants and properly disposed of off-site.

Sewage from the buildings and toilet manifold systems will be discharged to the sanitary sewer system in the vicinity of Church Street. One of the three existing on-site sewage pump stations will be relocated and one will be upgraded to handle increased flows.

All underground storage tanks will be registered with the CTDEP.

## **24.3 MITIGATION**

Utility service disruptions during the Proposed Action construction will be minimized through close coordination of construction activities and scheduling with utility providers and giving advanced notice to nearby customers of anticipated outages. Project engineers will coordinate thoroughly with utility providers to minimize environmental and community impacts to the greatest extent practicable.

Wastewater discharges will go into holding tanks which will be pumped out and contents disposed of at an off-site facility by a licensed waste hauler, or will be treated and ultimately discharged to the sanitary sewer system.

#### **24.4 SUMMARY OF IMPACTS**

The Proposed Action will result in some impacts to public utilities and services. Temporary, short-term utility service disruptions will potentially occur during the project construction period. However, customers will be notified in advance of these potential service disruptions. Wastewater discharges to the sanitary sewer system will first be treated or properly disposed off-site.

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## 25 ENERGY REQUIREMENTS

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### 25.1 EXISTING SETTING

Existing energy consumption on the NHRV site includes the use of electricity, natural gas, and fuel oil associated with industrial, commercial, and office uses. Fossil fuels are also consumed by vehicles on the site and the surrounding environs. Electricity, provided by UI, is used to power the MNR New Haven Line. Natural gas is provided by Southern Connecticut Gas Company, and fuel oil is provided by various companies.

As noted in Chapter 24 on Public Utilities and Services, electrical power is brought to the NHRV via overhead and underground power lines that run along perimeter streets. Substations providing power to the site are found on Hallock Street, Union Avenue and Church Street South. Electric power is fed to the rail yard, individual buildings, pump stations, yard lights, and other facilities.

A natural gas line runs from the south side of the rail yard in the vicinity of the east side of the Church Street overpass north to the former Amtrak power plant, where the line branches to feed various other buildings. Portions of the gas line network appear to have been abandoned and capped. A second line enters the rail yard from the south through an easement and travels north to the existing EMU Shop and west to the existing Wheel True Building.

There is also a large propane tank on the southern side of the Proposed Action site, with lines running northwest and dead-ending at the Union Station platforms and a former Guard Shack location.

### 25.2 DIRECT AND INDIRECT IMPACTS ON ENERGY

#### **No-Build Alternative**

The No-Build Alternative will maintain the area in its present condition, and, therefore, the rate of energy demand/consumption would remain essentially constant.

#### **Proposed Action**

The Proposed Action includes the construction of new facilities in the NHRV, with increased energy usage. New catenary systems will require power. New structures and parking areas will require lighting, as will pedestrian walkways and stairwells. The large propane tank on the southern portion of the site is used for old switch heaters and will be removed. All new switch heaters will be electric.

As far as energy availability, UI estimates that, with the referenced upgrades, there will be adequate energy supply to meet the increased demand at the NHRV site. This site, zoned for

transportation uses, permits activities which have similar energy requirements as the Proposed Action.

From a regional perspective, it is anticipated that the Proposed Action will have a positive impact on the consumption of energy because it will improve access to and enhance the use of mass transportation. Thus, the Proposed Action is expected to contribute to a reduction in the consumption of fossil fuels associated with vehicular traffic on the region's roadways, especially during peak commuting periods.

### **25.3 MITIGATION**

Temporary, construction period utility service disruptions will be minimized through close coordination of construction activities and scheduling with utility providers and giving advanced notice to customers of anticipated outages. Project engineers will coordinate thoroughly with utility providers to minimize environmental and community impacts to the greatest extent practicable.

### **25.4 SUMMARY OF IMPACTS**

There will be an increased usage of energy as a result of the Proposed Action. The overall impact, however, is beneficial, as the Proposed Action will contribute to an improved mass transportation system.

There will be temporary, construction period utility service disruptions. However, these disruptions will be minimized through close coordination of construction activities and scheduling with utility providers and giving advanced notice to customers of anticipated outages.

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## 26 ENVIRONMENTAL RISK SITES AND HAZARDOUS MATERIALS

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### 26.1 EXISTING SETTING

The Proposed Action study area and surrounding vicinity has a history of intensive use and development.

A Task 110 Corridor Land Use Evaluation for the adjacent Long Wharf Circulation Study Intermodal Access Road, prepared by the Maguire Group (November 2006), includes information on the parcels that comprise the NHRV site. The Task 110 study involved a review of existing and historic land uses, a review of federal and state environmental regulatory databases, a review of Sanborn Fire Insurance maps, and field reconnaissance/site walks. The following information relative to the NHRV property is contained within the Task 110 report:

Union Avenue (Lots 1.03 & 1.04, Block 1300, Map 237): Approximately 74-acre parcel that houses the NHRV. According to the field cards for the site, the property contains at least eight (8) industrial warehouse-type buildings that were constructed between 1900 and 1985 as well as numerous smaller outbuildings. On-site activities include the operation and maintenance of trains for passenger transport. The property has a high risk of encountering environmental contamination.

#### Federal CERCLA List:

The NHRV property (Metro-North Facility) (EPA I.D. No. CTD983870866) is on the Federal CERCLA list and is also listed under the Amtrak General Maintenance Facility (EPA I.D. No. CTD983870841). The site was first listed in 1989 and a Preliminary Assessment was completed in 1989, a Site Inspection was completed on 1994, and a Site Reassessment was conducted in 2001.

#### RCRA Generators List:

The NHRV property (Shore Line East Maintenance Facility) is listed as a small quantity generator of hazardous waste (EPA I.D. No. CTR000500405). Wastes generated at the site include ignitable wastes, solvents, and benzene. Also, MNR is listed as a large quantity generator of hazardous waste (CTD980667711). Wastes generated by MNR include ignitable wastes, solvents and lead. MNR also received several RCRA violations for recordkeeping, training, waste accumulation, prevention, and contingency planning in 1998. Also, the National Railroad Passenger Corporation (Amtrak) is listed at the site as a former generator of RCRA hazardous waste (EPA I.D. No. CTD000845206).

### CTDEP Inventory of Hazardous Waste:

The NHRV (Metro-North Facility) was listed in 1990 for the release of PCBs to the ground. The site is also listed under Conrail Consolidated Corporation (a.k.a. Amtrak National Railroad Passenger Corporation) (EPA I.D. No. CTD983870841) for the historical release of solvents and oil to the ground for over 100 years. Recovery wells are in operation at the site.

### Underground Storage Tanks:

The NHRV property has the following tanks registered to the site:

#### **Shore Line East Maintenance Facility – New Haven Rail Yard**

- 1) 1994 - 10,000 gallon – In use – Waste Oil – Steel Tank

#### **New Haven Maintenance Facility – New Haven Rail Yard**

- 1) 1985 – 10,000 gallon – Removed 1999 – Diesel Fuel – Steel Tank
- 2) 1985 – 10,000 gallon – Removed 1999 – Gasoline – Steel Tank
- 3) 1981 – 10,000 gallon – In Use – Waste Oil – Steel Tank
- 4) 1983 – 5,000 gallon – Removed 1998 – Diesel Fuel – Steel Tank
- 5) 1983 – 10,000 gallon – Removed 1998 – Diesel Fuel – Steel Tank

#### **New Haven Rail Yard**

- 1) Date Not Listed – 275 gallon – Abandoned in Place – Heating Oil – Steel Tank

There are no Leaking Underground Storage Tank (LUST) Records for the NHRV parcel.

### Permits and Wastewater Discharge Sources:

The following permits were granted for the NHRV property by CTDEP:

- 1) Permit No. SP0000036 in 1987
- 2) Permit No. SP0000415 in 1988
- 3) Permit No. GSW001675 (general stormwater) in 1996
- 4) Permit No. CT0030139 in 1997

### Property Transfer Filings:

A Form III indicating that a release had occurred at the site was filed for a 1990 property transfer when the State of Connecticut purchased a portion of the NHRV property from Amtrak Railroad.

### Oil & Chemical Spills – 1990 to Present:

Over 50 spills were recorded for the NHRV site. The following summarizes the most recent serious releases reported for the property:

**February 28, 1993:** 500 gallons of diesel fuel spilled due to a gauge malfunction. The spill was contained and removed and the impacted soil was excavated for offsite disposal.

**October 5, 1997:** 3,000 gallons of diesel fuel spilled due to a tank overflow. The spill was contained and removed.

**February 1, 2000:** One pound of PCB oil was found in a sump in the MU Shop. The spill was reportedly cleaned up.

**September 28, 2001:** 100 gallons of diesel fuel spilled due to a transfer line failure. The spill was contained and removed.

**February 1, 2002:** Approximately 8,200 gallons of diesel fuel spilled due to a pump failure. A cleanup contractor was hired to clean up the spill.

**May 1, 2002:** 30 gallons of oil containing PCBs spilled due to a container failure. The spill was contained and removed.

**May 11, 2004:** 125 gallons of oil spilled due to a hose failure. The spill was reportedly contained and removed.

#### Asbestos and Lead Paint:

Due to the age of many of the buildings located on the NHRY property, there is the likelihood that asbestos containing materials (ACM) and lead-based paint may also be present on site.

**Conclusion:** The property has been assigned a high risk designation. A high risk designation is assigned to parcels with visible signs of chemical release or in which on-site activities conducive to chemical release were noted or suspected. All projects will have a specific Task 210 Subsurface Evaluation prepared. These evaluations are ongoing and at different stages for each breakout project associated with the Proposed Action.

## **26.2 DIRECT AND INDIRECT IMPACTS FROM ENVIRONMENTAL RISK SITES AND HAZARDOUS MATERIALS**

### **No-Build Alternative**

The No-Build Alternative will be a continuance of existing conditions. There will be no direct or indirect impacts to the surrounding environment from potential exposure to and/or release of hazardous materials.

### **Proposed Action**

The NHRY has been an active rail yard for over a century. This intensive rail activity has resulted in various degrees of contamination throughout the property, some of which has been successfully cleaned-up and remediated and some of which has not.

The Proposed Action, which essentially involves overhauling and reconfiguring a large portion of the existing NHRY in order to accommodate the acceptance of and future maintenance of new

M-8 rail cars, will undoubtedly encounter contaminated areas that will need to be remediated. As the project design moves forward, CTDOT will enlist the services of a Licensed Environmental Professional (LEP) who will further investigate and characterize the NHRY property and recommend remediation strategies for those portions of the rail yard that pose a risk to employees, construction workers, and the general public. The remediation strategies will be coordinated with the CTDEP to ensure full compliance with the Remediation Standard Regulations (RSRs) prior to their ultimate implementation.

In general, the presence of hazardous materials and possible contamination on the NHRY site will ultimately have a direct impact on the implementation of the Proposed Action. Increased construction costs may be incurred related to potential remedial activities, such as the removal of USTs, abatement of contaminated soils and groundwater, and the removal of lead and asbestos containing materials prior to existing building and ancillary facility demolition. These types of measures may be necessary in order to reduce the potential contamination risk to construction workers, commuters, and nearby residents.

During construction, the primary impact related to hazardous materials will be the generation of debris from the demolition of Building #10 and other obsolete or outdated rail facilities, such as tracks and electrical components. If ACM, lead-based paint, or polychlorinated biphenyls (PCBs) are identified, they will need to be professionally removed, abated, and disposed of at an appropriate waste handling facility prior to any demolition or construction activities.

Overall, the potential for long-term adverse impacts related to hazardous materials exposure from the Proposed Action will be substantially reduced as regulations are in place to ensure that the site is thoroughly characterized and remediated prior to becoming occupied and fully operational. Additionally, the new facilities will be designed with state-of-the-art waste collection and disposal systems and technologies that will help to minimize future contamination risks at the site once the new facilities become operational.

### **26.3 MITIGATION**

The nature and extent of hazardous materials contamination at the NHRY site is being investigated and documented. Remediation strategies will be developed by LEPs and will be fully coordinated with the CTDEP to ensure that RSRs are met. A site specific Health and Safety Plan for construction workers will be developed in accordance with Occupational Safety and Health Administration (OSHA) guidelines.

With respect to demolition debris, it is recommended that all debris be segregated and tested. Based on the separation of different waste streams, the following mitigation is proposed:

- **Asbestos Containing Materials:** As required by the U.S. Environmental Protection Agency (EPA) National Emission Standard for Hazardous Air Pollutants, regulated ACM will be removed from buildings slated to be torn down prior to any demolition activities that could break up, dislodge, or similarly disturb the material or preclude the access to the material for subsequent removal. All ACM will be disposed of as special waste. If there will be more than three (3) linear feet or three (3) square feet of ACM,

abatement will be performed by a licensed asbestos abatement contractor. Any removal of ACM from buildings will proceed in accordance with CT Department of Public Health, EPA, and OSHA regulations and guidelines.

- **Lead-Based Paint:** Renovation/demolition activities associated with lead-based paint will be performed using lead safe work practices, and workers will be trained at a minimum according to OSHA lead standard (29 CFR 1910.1025 and 1926.62). Abatement will be performed by a licensed contractor and/or contractor with the required OSHA training.

It is understood that PCB's have been removed from NHRY, however, the potential for trace PCB's may still exist at the NHRY site. PCB suspected materials will be tested and disposed of at an appropriate waste handling facility by a licensed hazardous materials contractor.

## **26.4 SUMMARY OF IMPACTS**

The NHRY site is an active rail yard with known contamination issues. Construction of the improvements will involve demolition of existing buildings and rail facilities as well as excavation and grading to prepare the site for foundations, new track placement, and utility connections among other improvements. These activities may result in potential temporary exposure of construction workers to hazardous materials and/or contamination that resides at the NHRY site, and may also result in increased costs for treatment, containment, and/or disposal. A remedial action plan will be developed and fully coordinated with the CTDEP to ensure compliance with RSRs and thereby minimize potential exposure impacts to employees, commuters and nearby residents.



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## 27 CONSTRUCTION IMPACTS

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### 27.1 TEMPORARY IMPACTS

Construction of the Proposed Action will begin in 2008 and be completed by 2020. The following types of construction equipment, among others, will be used to demolish existing buildings and ancillary railroad facilities, prepare the site, and construct the new rail yard buildings and associated improvements:

- Dump trucks
- Dozers
- Backhoes
- Cranes
- Jackhammers and other pneumatic tools
- Loaders
- Pile drivers
- Mixers
- Air Compressors
- Generators
- Scrapers and Graders
- Steam Rollers

Demolition and construction activities will result in a variety of temporary impacts including:

- **Community Disruption:** Truck traffic and noise during the construction period may have temporary impacts on nearby neighborhoods and the community.
- **Air Quality:** During clearing and construction of the proposed facility and associated paved surfaces potential air quality impacts include: airborne dust particles from exposed soils and emissions from idling and mobile construction vehicles.
- **Noise:** Vehicles and construction activity creates noise which impacts nearby residential and other sensitive land uses, such as places of worship.
- **Traffic:** There will be temporary, construction period impacts on vehicular movement within the NHRY area.
- **Water Resources and Water Quality:** Construction activity can result in erosion and runoff during storm events, impacting water resources and water quality.
- **Public Utilities and Services:** There may be temporary, construction period utility disruptions. Some of the existing utility infrastructure will need to be relocated and/or replaced to accommodate the new facilities and associated improvements.

## 27.2 MITIGATION

To mitigate the potential impacts during construction, an efficient construction phasing and sequencing plan will be developed that will include the following measures:

- A Maintenance and Protection of Traffic (MPT) plan to ensure that temporary traffic impacts are minimized. Techniques that may be employed include signage, detours, and employment of officers to direct traffic.
- A comprehensive Erosion and Sedimentation Control Plan (E&S Plan) and a Stormwater Pollution Prevention Plan (SWPPP) will be developed specifically for the NHRY. These plans will be implemented and maintained in conformance with the *Connecticut Guidelines for Soil Erosion and Sediment Control* (ConnDEP, 2002) and other federal, state and local policies. Silt fences, hay bales, and other controls will be properly installed adjacent to the Proposed Action's disturbance limits and around catch basins, and will be maintained throughout the period of active construction until exposed soils have become stabilized.
- To minimize impacts to air quality during construction the following best management practices will be followed:
  - Minimization of exposed erodible earth area to the greatest extent possible.
  - Stabilization of exposed earth with grass, pavement, or other cover as early as possible.
  - Application of stabilizing agent (i.e., calcium chloride, water) to the work areas and haul roads.
  - Covering, shielding, or stabilizing stockpiled material as necessary.
  - Use of covered haul trucks.
  - To minimize drag out, the incidental transport of soil by construction equipment from unpaved to paved surfaces, rinsing of construction equipment with water or any other equivalent method.
  - Use of construction equipment with air pollution control devices.
  - Use of "clean" fuels including ultra-low sulfur diesel fuel (15 ppm sulfur), compressed natural gas or emulsified fuels (e.g., Purinox, approved by the California Air Resources Board).
  - Eliminating any unnecessary idling to no more than 3 minutes.
- Appropriate mitigation for excessive idling of construction equipment and fugitive dust control are described in Section 22a-174 of the Regulations of Connecticut State Agencies. Mitigation measures to control impacts to air quality during construction will include wetting and stabilization to decrease dust, cleaning paved areas, placing tarps over truck beds when hauling dirt, and staging construction in such a way to minimize the amount and duration of exposed earth. In addition, the contractor will be required to keep equipment maintained and operating efficiently in a clean manner to mitigate any

exhaust impacts. Construction vehicles will also need to comply with the three-minute idling regulation.

- While construction noise is exempt under Section 22a-69-1.8(g) of the RCSA, construction documents will require the contractor to limit the duration and intensity of noise generated by construction. To mitigate the potential impacts during construction:
  - Noise abatement measures in accordance with CTDOT Form 816 will be included in construction specifications. Such measures include appropriate mufflers on all construction vehicles and restrictions on hours of operation. Nighttime activities will be avoided.
  - Truck traffic will be routed onto streets with the fewest homes. Construction vehicles and equipment will enter the site from Long Wharf Avenue and Brewery Street entrance, which has good access to I-95, I-91, and Route 34. The Hallock Avenue entrance (adjacent to several residences) will be restricted from use for construction. And, it is not anticipated that Union Avenue will need to be used for construction purposes.
  - There are some existing obstructions, such as buildings, already buffering noise. However, there may be an additional need for the erection of temporary noise barriers around the work site where such barriers are deemed effective at buffering adjacent land uses from construction noise.
  - Ensure muffler devices on construction equipment are installed and maintained properly.
  - The project team will conduct ongoing coordination with the City of New Haven to employ other measures that may be effective to minimize noise disturbance to nearby residents.
  - Overall, the Proposed Action is envisioned to be in compliance with the Connecticut Noise Regulations. The City of New Haven Noise Ordinance is contained within Section 18-19 of the City's Zoning Regulations. While State of Connecticut projects are not required to comply with local zoning, the operation of the Proposed Action will be conducted in a manner that meets the objectives of the City's noise regulations to the extent feasible.
- Incidental exposure of hazardous materials during construction will be addressed prior to commencement of construction, with the development of a site-specific hazardous materials management plan. A Health & Safety Plan for construction workers will also be developed in accordance with OSHA guidelines. No hazardous materials other than diesel fuel for construction equipment will be stored on site during construction. All fuel storage tanks used during construction will be equipped with secondary containment systems.
- During all phases of construction, efforts will be made to avoid and minimize impacts to utilities in the area to the greatest extent practicable. Extensive coordination has and will continue to take place with the City of New Haven and all affected utility providers.
- During construction, track outages will be closely coordinated with the appropriate authorities and will be limited to the greatest extent practicable.

- The FHWA Work Zone Safety and Mobility Rule will be adhered to in accordance with CTDOT's *Policy on Systematic Consideration and Management of Work Zone Impacts*, (Attached in Appendix G).

### **27.3 SUMMARY OF IMPACTS**

Construction will be planned, phased, and sequenced to minimize adverse impacts on Community and Neighborhoods, Air Quality, Traffic, Water Resources and Water Quality, Public Utilities and Services, and from Noise. Rail service interruptions will also be minimized.

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## 28 INDIRECT AND CUMULATIVE IMPACTS

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Indirect impacts, also known as secondary impacts, are effects caused by an action, which occur later in time or at a distance from the Proposed Action, yet are reasonably foreseeable (i.e., probable). Cumulative impacts are the total incremental effects on a resource, ecosystem, or human community due to past, present and reasonably foreseeable future activities, undertaken by any party. In assessing what may happen in the future, reasonably foreseeable activities are actions estimated to be probable, based on observed trends, rather than simply possible, based on speculation.

### 28.1 OVERVIEW OF PROJECT IMPACTS

The Proposed Action consists of construction of new facilities at the NHRV to serve the existing and future fleet of rail cars. The Proposed Action will provide the NHRV with the storage, dispatching, inspection, maintenance, cleaning, and support functions needed for the existing and incoming fleet of M-8 rail cars. The impacts of the Proposed Action are described in detail in Chapters 5 through 27 of this document and include impacts to wetlands, the 100-year floodplain, and the coastal flood hazard area (CFHA). The Proposed Action will also have beneficial impacts, with an improved rail yard contributing to Connecticut's transportation system. The additional facilities at the NHRV will provide additional jobs, yielding a beneficial impact to socio-economic conditions in New Haven and the surrounding region.

### 28.2 INDIRECT IMPACTS

An indirect beneficial impact from the Proposed Action is an improved state rail transportation system.

### 28.3 CUMULATIVE IMPACTS

Only those resources potentially affected by a Proposed Action are considered pertinent in regard to cumulative impact analysis. Based on the impact analysis results for the Proposed Action, the potentially affected resources for the cumulative impact analysis include water quality, wetlands, floodplains, and the coastal flood hazard area. A cumulative impact analysis typically focuses on the resource categories to be directly impacted by a project and on the area within which direct impacts will be felt.

*Socio-economic:* Past and recent economic development projects in the Long Wharf area (such as opening of IKEA home furnishings store) combined with the NHRV, create jobs in the area. However, other businesses, such as Pirelli Tire, have closed or left New Haven. The relocation of Gateway Community College moves jobs from Long Wharf to Downtown New Haven. The cumulative impact has been a stable socio-economic condition in the area surrounding the

NHRY. This stable economic condition is anticipated to persist into the future given the planned improvements in the Long Wharf Area.

*Water Quality:* The Proposed Action is within an already highly urbanized area of New Haven. Surrounding land uses include commercial and industrial areas and major transportation facilities, such as I-95. Transportation projects (such as this Proposed Action, I-95/Quinnipiac River bridge improvements, Long Wharf transportation improvements) and other development projects bring about an increase in impervious surfaces (i.e., paved access roads and parking areas, rooftops, and sidewalks) and, consequently, an increased risk of water quality degradation resulting from increased runoff volumes and sheet flow velocities. Such runoff contains a higher load of pollutants derived from, in particular, vehicular sources. Transportation projects inherently contribute to cumulative impacts on water quality due to their intensive vehicular use.

*Wetlands:* The Proposed Action directly impacts 10,130 square feet (0.232 acres) of wetland area. However, the USACE has determined (May 2007; see correspondence in Appendix A) that the wetlands are isolated, with no defined inlet or outlet. The wetlands are not hydrologically connected to any other wetland areas, and there are no adjacent, bordering, contiguous, or neighboring waters or wetlands at the site. Degradation or loss of these wetlands will not affect other waters of the U.S. Nevertheless, cumulative impacts from all forms of development, including transportation projects, despite state and federal regulatory programs, tends to result in the net loss of wetlands and degradation of wetland function, causing (for instance) reduced ability to purify stormwater runoff.

*Floodplain and Coastal Flood Hazard Area:* Prior to the 1940s, the original shoreline was along the easterly edge of the rail yard. Over time, the former mud flats have been filled in and developed. Today, the 100-year floodplain and the coastal flood hazard area continue to be developed. The Proposed Action impacts a small part of this CFHA.

## **28.4 MITIGATION**

Mitigation of secondary and cumulative impacts will be achieved through careful project planning including alternatives analysis, avoidance and minimization of project impacts.

## **28.5 SUMMARY OF IMPACTS**

There will be a secondary, beneficial impact to the state's rail transportation system. There will be a cumulative, beneficial impact to Socio-economic Conditions. There will be adverse cumulative impacts to Wetlands, Floodplains, and the Coastal Flood Hazard Area.

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## 29 COST BENEFIT ANALYSIS

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The primary costs of the Proposed Action arise from the monetary outlay and energy consumption required for constructing the new facilities and relocating materials and supplies to be reused from the existing facilities. The estimated cost for the Proposed Action is approximately \$1.1 billion. However, the efficient inspection, maintenance, storage and dispatching of the expanding fleet of multiple unit electric rail vehicles being acquired to facilitate rail transportation increases depends upon these facilities. The existing campus does not have the capacity to handle more vehicles. In addition, the new M-8 rail vehicles have high technology components and systems that cannot be maintained within the existing facilities.

Costs associated with environmental impacts are minimal, as the Proposed Action is compatible with surroundings, located on a previously disturbed site, and represent improved facilities rather than a new use. This benefit is secondarily assured by the building program for the new facilities, which will incorporate energy-efficient materials and building techniques, unlike the existing antiquated buildings. In addition, the benefits to Metro-North operations are numerous. These include efficiencies in carrying out the repair and electrical program, moving materials, and maintaining the facility itself.

Although the monetary costs of the Proposed Action is sizeable, without the project, substantial investments in the existing antiquated facilities would be needed to bring those facilities into environmental and building code compliance. After those expenditures, the facilities would still be inefficiently configured and inconveniently located in relation to one another, while the aging buildings would continue to consume relatively high levels of energy. By eliminating the need for high-cost long-term capital improvements associated with the disparate and inefficient facilities, the Proposed Action is expected to “pay for itself” over time.

Considering the immediate and longer-term operational and financial benefits of the Proposed Action, weighed against the project’s construction costs and minor adverse environmental impacts, the Proposed Action appears to be an advantageous activity that justifies the expenditures.



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### **30 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

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Irreversible and irretrievable commitments of resources caused by the Proposed Action include energy, construction materials, human labor and finances. Energy will be consumed in the Proposed Action construction. A variety of natural, synthetic and processed construction materials will be utilized to construct the Proposed Action. The dedication of human labor to the construction and operational phases of the Proposed Action represents an irretrievable expenditure of time and production that is thus unavailable for other purposes. Finally, the expenditures required, once committed, are no longer available for other purposes and, once spent, cannot be regained.



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## **31 LIST OF POTENTIAL ENVIRONMENTAL CERTIFICATES, PERMITS, AND APPROVALS**

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This section identifies potential permits, approvals, certifications, and registrations that may be required for completion of the Proposed Action.

Federal:

- FEMA, Letter of Map Revision Approval, dated August 15, 2008

State:

- CTDEP, Inland Wetlands and Watercourses Permit, approved January 14, 2008.
- CTDEP, Remedial Action Work Plan
- CTDEP, Engineered Control Variance
- 
- CTDEP, Coastal Consistency Review, approved January 28, 2008.
- CTDEP, Flood Management Certification, received November 14, 2007.
- CTDEP, Registration for Stormwater Associated with Industrial Activity
- CTDEP, NPDES Discharge Permits

Local:

None needed



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## 32 COORDINATION PROCESS

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The preparation of this EA/4(f) document involved coordination with the public as well as with federal and state agencies with jurisdiction over potentially affected resources. Coordination with the City of New Haven, Metro-North, Amtrak, and various utility companies was also integral to the preparation of this environmental document.

To initiate the EA/EIE process, CTDOT placed a public scoping notice for the Proposed Action in Connecticut's Environmental Monitor on August 8, 2006 (refer to the scoping notice contained in Appendix A). The notice requested that written comments be submitted to CTDOT by August 31, 2006. Since there were no requests for a public scoping meeting on the Proposed Action, one was not held. A Public Scoping Meeting is conducted when it is requested by 25 or more individuals or by an association that represents 25 or more members during the 30-day scoping comment period.

During the 30-day comment period, the following resource agencies provided scoping comments:

- State of Connecticut, Department of Health
- State of Connecticut, Department of Environmental Protection
- State Historic Preservation Officer

Coordination and correspondence letters are included in Appendix A.

During compilation of the EA, extensive coordination took place with federal, state and regional resource and planning agencies for the purpose of identifying existing conditions, potential Proposed Action impacts, and mitigation. In addition, individuals, officials and staff from the City of New Haven and other organizations were contacted for information and input regarding various aspects of the Proposed Action.

On June 25, 2008, a public information meeting was held in New Haven to present the Proposed Action details, schedule, and an overall status to the public. The hearing transcript and comment letters received during the public comment period are included in Chapter 33 of this EA/4(f). Under NEPA, this EA will be released for a 30-day public review. If no significant impacts are identified, CTDOT will send the EA and any comments received to FTA with the recommendation of a Finding-of-No-Significant Impact (FONSI).

Upon release of the document, comments may be addressed to:

Connecticut Department of Transportation  
Mr. Edgar T. Hurle, Transportation Planning Director  
Office of Intermodal and Environmental Planning  
2800 Berlin Turnpike, P.O. Box 317546  
Newington, CT 06131-7546



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### **33 PUBLIC HEARING TRANSCRIPT, COMMENTS AND RESPONSES**

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This chapter documents all comments received during the public scoping process, the public comment period, and the public hearing. The public comment period was from May 20, 2008 to July 9, 2008. Both comments and responses to each comment are provided herein.

Comments were received from the following agencies and individuals:

Suzanne Blancaflor, Environmental Health Section, Connecticut Department of Public Health, May 29, 2008.

Lori Mathieu, Drinking Water Section, Connecticut Department of Public Health, May 29, 2008.

Frederick L. Riese, Connecticut Department of Environmental Protection, July 9, 2008.

John DeStefano, Jr., Mayor, City of New Haven, June 30, 2008.

Matthew Thomas Sawyer, SCSU student, June 25, 2008.



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## 34 LIST OF PREPARERS

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The following individuals prepared technical portions of this Environmental Assessment/Environmental Impacts Statement:

**PB Americas, Inc.**

148 Eastern Boulevard, Suite 200  
Glastonbury, CT 06033  
Glen Hayden — Project Manager

**Fitzgerald & Halliday, Inc. — Environmental Analysis & Documentation**

72 Cedar Street  
Hartford, CT 06106

Ms. Marianne Latimer	Principal Planner II	Project Manager, Water Resources and Water Quality, Floodplains, Air Quality
Ms. Laurel Stegina	Senior Planner	Deputy Project Manager, Land Use, Consistency, Socio-economics, Environmental Justice, Community Disruption, Noise, Visual/Aesthetics, Safety and Security, Threatened and Endangered Species, Farmlands, Coastal Resources, Public Utilities, Energy
Mr. Sam Eisenbeiser	Senior Planner	Traffic and Parking
Ms. Stacey Vairo	Senior Planner	Section 106, Section 4(f), Section 6(f)
Mr. David Laiuppa	Planner II	Graphics and Data Compilation
Mr. Paul Stanton	Principal Planner	Wetlands, Hazardous Materials/Risk Sites, QA/QC



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## **APPENDICES**

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**APPENDIX A: SCOPING NOTICES AND AGENCY  
CORRESPONDENCE**

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Connecticut  
Council on  
Environmental  
Quality

79 Elm Street  
Hartford, CT 06106

Phone:  
(860) 424-4000  
Fax:  
(860) 424-4070

Karl J. Wagener,  
Executive Director  
E-Mail Address:  
[karl.wagener@  
po.state.ct.us](mailto:karl.wagener@po.state.ct.us)

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The official site for project information under  
the Connecticut Environmental Policy Act

August 8, 2006

### Scoping Notices

1. **NEW!** Improvements to the New Haven Rail Yard Maintenance Facilities  
(New Haven)

### Environmental Impact Evaluations available for review and comment

1. 950-Car Parking Garage at Eastern Connecticut State University  
(Willimantic)

**The next issue will be published on August 22, 2006.**  
**Subscribe to e-alerts to receive an e-mail when The Environmental  
Monitor is published.**

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## Scoping Notices

Scoping Notices have been issued for the following state projects. These projects are in the earliest stages of planning. At the scoping stage, detailed information on a project's design, alternatives, and environmental impacts does not yet exist. Sponsoring agencies are asking for comments from other agencies and from the public as to the scope of alternatives and environmental impacts that should be considered for further study. Send your comments to the contact person listed for the project by the date indicated.

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### 1. Notice of Scoping for Improvements to the New Haven Rail Yard Maintenance Facilities

**Municipality where proposed project might be located:** New Haven

**Project Description:** Reconstruction, additions to, and overall improvements and upgrades to the New Haven rail yard maintenance facilities.

**Project Map:** [Click here to view a map of the project](#)

**Written comments from the public are welcomed and will be accepted until the close of business on: August 31, 2006**

**Any person can ask the sponsoring agency to hold a Public Scoping Meeting by sending such a request to the address below. If a meeting is requested by 25 or more individuals, or by an association that represents 25 or more members, the sponsoring agency shall schedule a Public Scoping Meeting.**

**Additional information about the project can be viewed in person at or online at:** [www.newhavenrailyard.org](http://www.newhavenrailyard.org).

**Written comments and/or requests for a Public Scoping Meeting should be sent to:**

**Name:** Mr. Edgar T. Hurle - Transportation Planning Director  
**Agency:** Connecticut Department of Transportation  
**Address:** 2800 Berlin Turnpike  
Newington, CT 06131  
**Fax:** 860-594-3028  
**E-Mail:** [Edgar.Hurle@po.state.ct.us](mailto:Edgar.Hurle@po.state.ct.us)

**If you have questions about the public meeting, or other questions about the scoping for this project, contact:**

**Name:** Mr. Keith T. Hall - Transportation Supervising Planner  
**Agency:** Connecticut Department of Transportation  
**Address:** 2800 Berlin Turnpike  
Newington, CT 06131  
**Phone:** 860-594-2926  
**Fax:** 860-594-3028  
**E-Mail:** [Keith.Hall@po.state.ct.us](mailto:Keith.Hall@po.state.ct.us)

**The agency expects to release an Environmental Impact Evaluation for this project, for public review and comment, in July 2007**

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## **EIE Notices**

The following Environmental Impact Evaluations (EIEs) have been completed by state agencies and are available for review and comment.

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# 1. EIE Notice for New 950-Car Parking Garage at Eastern Connecticut State University

**Municipality where project is proposed:** Willimantic

**Address of Possible Project Location:** 83 Windham Street, Willimantic, Connecticut

**Project Description:** The purpose of the proposed action is to develop a 950-car parking garage on the site of the existing softball field on the northern end of the main campus of Eastern Connecticut State University.

**Project Map:** [Click here to view a map of the project area.](#)

**Comments on this EIE will be accepted until the close of business on August 21, 2006.**

**The public can view a copy of this EIE at the J. Eugene Smith Library on the campus of Eastern Connecticut State University or online at: <http://w3.sysoff.ctstateu.edu>**

**Any person can ask the sponsoring agency to hold a Public Hearing on this EIE by sending such a request to that address below by July 30, 2006. If a hearing is requested by 25 or more individuals, or by an association that represents 25 or more members, Connecticut State University must schedule a Public Hearing.**

**Send your comments about this EIE to:**

**Name:** Alexandria Roe  
**Agency:** Connecticut State University  
**Address:** 39 Woodland Street  
Hartford, Connecticut 06105  
**E-Mail:** [roea@so.ct.edu](mailto:roea@so.ct.edu)

**If you have questions about the public hearing, or where you can review this EIE, or similar matters, please contact:** same as above.

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The Adobe Reader is necessary to view and print Adobe Acrobat documents, including some of the maps and illustrations that are linked to this publication. If you have an outdated version of Adobe Reader, it might cause pictures to display incompletely. To download up-to-date versions of the free software, click on the Get Acrobat button, below. This link will also provide information and instructions for downloading and installing the reader.



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# STATE OF CONNECTICUT

DEPARTMENT OF PUBLIC HEALTH

**RECEIVED**

August 24, 2006

AUG 29 2006

Mr. Edgar T. Hurlle  
Transportation Planning Director  
Connecticut Department of Transportation  
2800 Berlin Turnpike  
Newington, CT 06131

ENVIRONMENTAL PLANNING  
DIVISION

RE: Notice of Scoping for Improvements to the New Haven Rail Yard Maintenance Facilities,  
New Haven, CT

Dear Mr. Hurlle:

The following comments are offered in response to your request concerning the Notice of Scoping for Improvements to the New Haven Rail Yard Maintenance Facilities, New Haven, CT.

A review of this document revealed limited information at this stage of the project. Should the project include any demolition or renovation of buildings, excavation of soils, or disturbance of existing infrastructure, then a plan must be in place to address lead contaminated soils, lead-based paint, and asbestos since these materials may be encountered and/or disturbed during demolition or excavating activities. Should the project include renovation or construction of occupied buildings, and then a plan should be in place to use radon resistant features.

The following summarizes the Department's position with regard to lead, asbestos, and radon issues:

## A. Lead-Based Paint

It does not appear that excavation or construction activities associated with this project are subject to the Department of Public Health (DPH) Lead Poisoning Prevention and Control (LPPC) Regulations (§§19a-111-1 through 19a-111-11).

Additionally, there are other issues that must be addressed related to lead-based paint. Among these issues are the following:

- Lead-based paint testing of paint on existing structures marked for demolition, or sampling for lead-in-soils should be performed by a lead inspector or lead inspector/risk assessor certified by the DPH.
- Planned demolition or soil removal activities should be performed using lead-safe work practices. If lead-based paint or lead contaminated soil is identified, the classification and disposal of generated waste must comply with the Resource Conservation Recovery Act (RCRA) and Connecticut Department of Environmental Protection standards (i.e. Toxicity Characteristics Leaching Procedure [TCLP] testing, reporting, and record keeping requirements).

Phone:



Telephone Device for the Deaf: (860) 509-7191

410 Capitol Avenue - MS # \_\_\_\_\_

P.O. Box 340308 Hartford, CT 06134

*Affirmative Action / An Equal Opportunity Employer*

Page 2

Edgar T. Hurle

Notice of Scoping for Improvements to the New Haven Rail Yard Maintenance Facilities,  
New Haven, CT

- Additionally, if lead-based paint, lead containing paint, or lead contaminated soil is identified, workers must be trained (as a minimum) according to the Occupational Safety and Health Administration (OSHA) lead standard (29 CFR 1926.62). Because other contaminants may also be present on the site, additional health and safety training may be required (e.g. hazardous waste and/or asbestos).

Additional inquiries on the subject of lead-based paint can be directed to Alan Buzzetti, Supervising Environmental Analyst, Lead Poisoning Prevention and Control Program at (860) 509-7299.

#### **B. Asbestos**

Any renovation or demolition of existing facilities that are associated with this proposed project would be subject to the provisions of the asbestos National Emission Standards for Hazardous Air Pollutants (40 CFR Part 61). As such, the facilities would be required to be thoroughly inspected to determine the presence of asbestos prior to the commencement of the renovation/demolition activity. An Inspector must conduct the asbestos inspection or a Management Planner licensed by the DPH. Asbestos abatement that involves more than three (3) linear feet or more than three (3) square feet of asbestos containing material must be performed by an asbestos abatement contractor licensed by the DPH. Asbestos abatement must be performed in accordance with all applicable federal, state and local regulations.

Please contact Ronald Skomro, Supervising Environmental Sanitarian, Asbestos Program at (860) 509-7367 regarding any issues related to asbestos.

#### **C. Radon**

The United States Environmental Protection Agency (EPA) developed a radon potential map using data from studies and surveys conducted in Connecticut. The map assigns each of the counties in Connecticut to one of three zones based on radon potential. The radon zone designation of the highest potential is Zone 1, the moderate potential is Zone 2, and the low potential is Zone 3. The proposed site is located in a high potential, Zone 1 area. Therefore, measures should be taken to help control radon and its harmful effects. The Connecticut Department of Public Health Radon Program recommends that during the construction of the building, radon resistant features should be built into the infrastructure of the building.

Page 3

Edgar T. Hurlé

Notice of Scoping for Improvements to the New Haven Rail Yard Maintenance Facilities,  
New Haven, CT

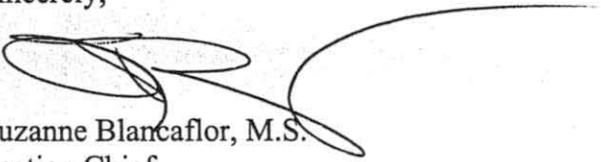
The list below describes the basic components of radon resistant new construction:

- a gas permeable layer, such as 4-inch gravel, placed beneath the slab to allow soil gases to move freely underneath the building
- plastic sheeting over the gas permeable layer and under the slab to help prevent soil gases from entering the home
- sealing and caulking all openings in the foundation floor to reduce soil gas entry
- a vent pipe, such as 6 inch PVC pipe, to run from the gas permeable layer through the building to the roof to safely vent soil gases above the building
- an electrical junction box installed in case an electric venting fan is needed later.

The facility should be tested for radon after construction is completed. If radon results are at or above 4.0 picocuries per liter (pCi/L), the existing system should be activated by installing an in-line fan. For a list of qualified radon mitigation contractors to assist with the system activation, please refer to the following website: [www.dph.state.ct.us/BRS/Radon/radon\\_program.htm](http://www.dph.state.ct.us/BRS/Radon/radon_program.htm)

Please contact Francesca Provenzano, Health Program Supervisor, Radon Program at (860) 509-7367 regarding any issues related to radon.

Sincerely,



Suzanne Blancaflor, M.S.  
Section Chief  
Environmental Health Section





STATE OF CONNECTICUT

DEPARTMENT OF ENVIRONMENTAL PROTECTION

OFFICE OF ENVIRONMENTAL REVIEW

79 ELM STREET, HARTFORD, CT 06106-5127

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**To:** Edgar T. Hurlle - Director of Environmental Planning  
DOT - Bureau of Policy & Planning, 2800 Berlin Turnpike, Newington

**From:** David J. Fox - Senior Environmental Analyst      **Telephone:** (860) 424-4111

**Date:** September 7, 2006      **E-Mail:** david.fox@po.state.ct.us

**Subject:** New Haven Rail Yard Maintenance Facilities

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The Department of Environmental Protection has received the Notice of Scoping announcing preparation of an Environmental Impact Evaluation (EIE) for proposed reconstruction, additions and upgrades to maintenance facilities at the New Haven Rail Yard. The following commentary is submitted for your consideration.

ConnDOT recently conducted CEPA review for the interim rail car service and inspection facility at the New Haven Rail Yard. Our scoping comments for that document, my memo dated January 21, 2005, as well as our comments on the EIE dated March 24, 2005 outlined the Department's potential concerns to be addressed during CEPA review at this location. These issues should be considered during preparation of the new EIE.

Thank you for the opportunity to review this project. If there are any questions regarding these comments, please contact me.

cc: Robert Kaliszewski, DEP/OPPD  
Carol Szymanski, DEP/OLISP





October 26, 2006

Mr. Michael J. Bartlett  
New England Field Offices Supervisor  
United States Fish & Wildlife Service  
70 Commercial Street, Suite 300  
Concord, NH 03301-5087

Subject: New Haven Rail Maintenance Facility  
New Haven, Connecticut

Dear Mr. Bartlett,

Fitzgerald & Halliday, Inc. is presently under contract to prepare an Environmental Impact Evaluation for the above referenced project. A review of the Connecticut Department of Environmental Protection (CTDEP) State and Federal Listed Species and Significant Natural Communities GIS database dated June 2006 for the project study area indicates that there are locations where potential conflicts with an endangered species and/or significant natural community may exist. A letter has been forwarded to the CTDEP requesting additional information relative to the study area.

To further support FHI's investigation into potential threatened and endangered species concerns, FHI requests that your office kindly forward us any federal threatened and endangered species information related to this project study area. A map depicting the project study area and CTDEP State and Federal Listed Species and Significant Natural Communities data is enclosed. We look forward to receiving any information you can provide us, and to future coordination with your office.

Very truly yours,

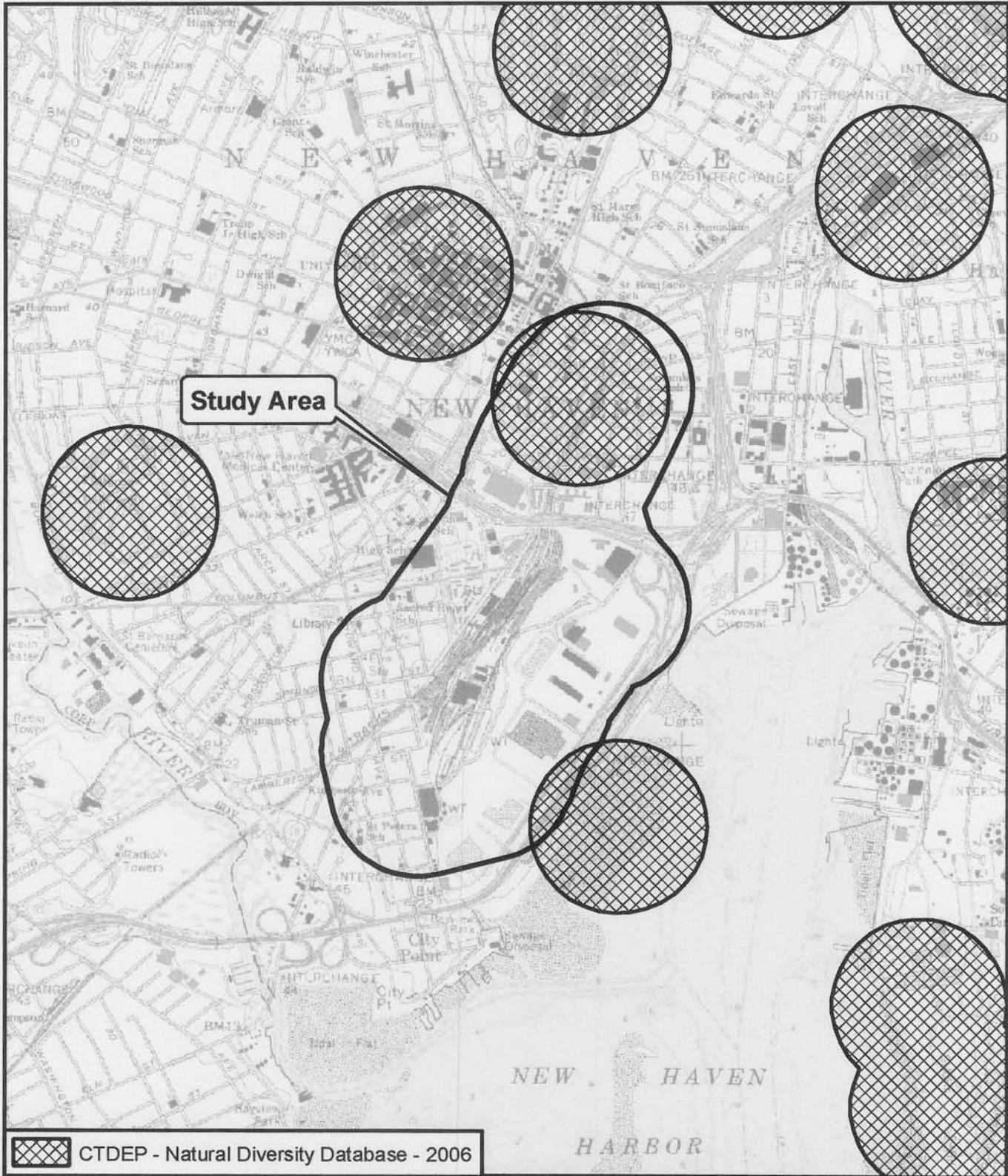
FITZGERALD & HALLIDAY, INC.

A handwritten signature in black ink, reading 'Laurel J. Stegina'. The signature is written in a cursive, flowing style with a large initial 'L'.

Laurel J. Stegina  
Senior Planner

Enclosure

cc: M. Latimer (FHI), K.T. Hall (ConnDOT), File P658.02



 CTDEP - Natural Diversity Database - 2006

# New Haven Rail Yard EA/EIE

New Haven, CT

1:24,000



U.S.G.S. Quadrangle: New Haven, CT



# United States Department of the Interior



FISH AND WILDLIFE SERVICE  
New England Field Office  
70 Commercial Street, Suite 300  
Concord, New Hampshire 03301-5087

November 27, 2006

Reference:	<u>Project</u>	<u>Location</u>
	Parking structure	Wilton, CT
	Rail maintenance facility	New Haven, CT

Paul Stanton  
Laurel Stegina  
Fitzgerald & Halliday, Inc.  
72 Cedar St.  
Hartford, CT 06106

Dear Mr. Stanton and Ms. Stegina:

This responds to your recent correspondence requesting information on the presence of federally-listed and/or proposed endangered or threatened species in relation to the proposed activity(ies) referenced above.

Based on information currently available to us, no federally-listed or proposed, threatened or endangered species or critical habitat under the jurisdiction of the U.S. Fish and Wildlife Service are known to occur in the project area(s). Preparation of a Biological Assessment or further consultation with us under Section 7 of the Endangered Species Act is not required.

This concludes our review of listed species and critical habitat in the project location(s) and environs referenced above. No further Endangered Species Act coordination of this type is necessary for a period of one year from the date of this letter, unless additional information on listed or proposed species becomes available.

Thank you for your coordination. Please contact us at 603-223-2541 if we can be of further assistance.

Sincerely yours,

Anthony P. Tur  
Endangered Species Specialist  
New England Field Office



# Connecticut Natural Diversity Data Base Review Request Form

Please complete this form *only* if you have conducted a review which determined that your activity is located in an area of concern.

Name: **Laurel Stegina**

Affiliation: **Fitzgerald & Halliday, Inc.**

Mailing Address: **72 Cedar Street**

City/Town: **Hartford**

State: **CT**

Zip Code: **06106**

Business Phone: **860-256-4914**

ext.

Fax: **860-760-6213**

Contact Person: **Laurel Stegina**

Title: **Senior Planner**

Project or Site Name: **New Haven Rail Maintenance Facility**

*Project Location*

Town: **New Haven**

USGS Quad: **New Haven**

Brief Description of Proposed Activities:

**Environmental Impact Evaluation for proposed improvements to the Connecticut Department of Transportation New Haven Rail Yard.**

Have you conducted a "State and Federal Listed Species and Natural Communities Map" review?

Yes       No      Date of Map:

Has a field survey been previously conducted to determine the presence of any endangered, threatened or special concern species?       Yes       No

If yes, provide the following information and submit a copy of the field survey with this form.

Biologists Name:

Address:

If the project will require a permit, list type of permit, agency and date or proposed date of application:

The Connecticut Natural Diversity Data Base (CT NDDDB) information will be used for:

- permit application
- environmental assessment (give reasons for assessment):

**State-funded project.**

- other (specify):

"I certify that the information supplied on this form is complete and accurate, and that any material supplied by the CT NDDDB will not be published without prior permission."

*Lucretia J. Stegura*

Signature

10/26/06

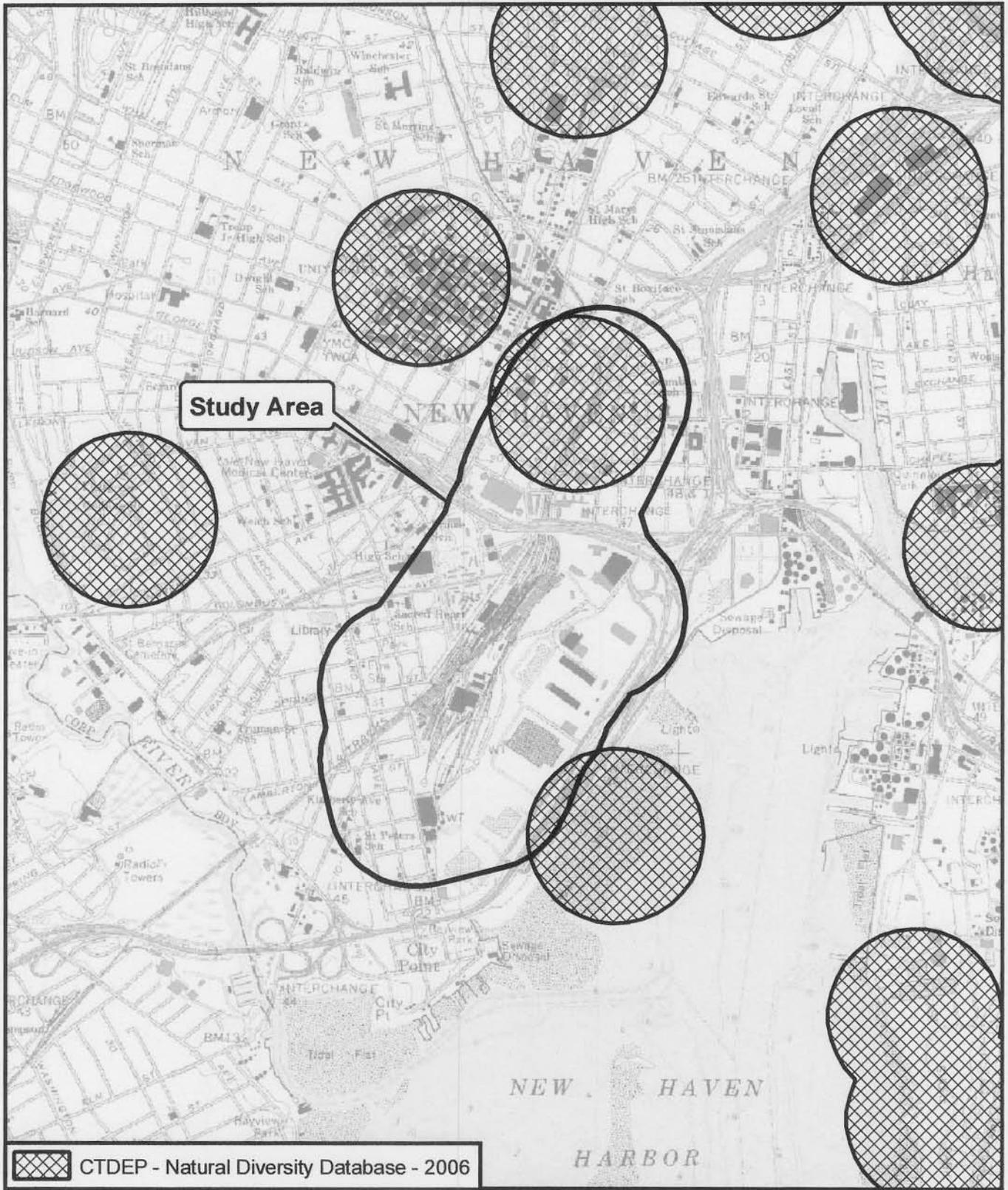
Date

All requests must include a USGS topographic map with the project boundary clearly delineated.

Return completed form to:

WILDLIFE DIVISION  
BUREAU OF NATURAL RESOURCES  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
79 ELM ST, 6TH FLOOR  
HARTFORD, CT 06106-5127

\* You must submit a copy of this completed form with your registration or permit application.



# New Haven Rail Yard EA/EIE

New Haven, CT

1:24,000

U.S.G.S. Quadrangle: New Haven, CT





STATE OF CONNECTICUT  
DEPARTMENT OF ENVIRONMENTAL PROTECTION



Bureau of Natural Resources  
Division of Wildlife  
79 Elm Street, 6<sup>th</sup> Floor  
Hartford, CT 06106  
Natural Diversity Data Base

November 27, 2006

Ms. Laurel Stegina  
Fitzgerald & Halliday, Inc.  
72 Cedar Street  
Hartford, CT 06106

re: Improvements to the New Haven Rail  
Maintenance Facility in New Haven,  
Connecticut

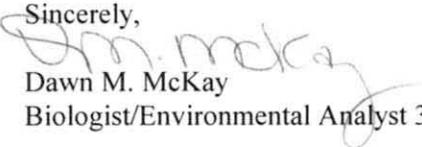
Dear Ms. Stegina:

I have reviewed Natural Diversity Data Base maps and files regarding the area delineated on the map you provided for the proposed improvements to the New Haven rail maintenance facility in New Haven, Connecticut. According to our information, there may be state-listed wildlife species that occur in the vicinity of this project site. I have sent your letter to Julie Victoria (DEP-Wildlife; 860-642-7239) for further review. Ms. Victoria will write to you directly with her comments.

Natural Diversity Data Base information includes all information regarding critical biological resources available to us at the time of the request. This information is a compilation of data collected over the years by the Natural Resources Center's Geological and Natural History Survey and cooperating units of DEP, private conservation groups and the scientific community. This information is not necessarily the result of comprehensive or site-specific field investigations. Consultations with the Data Base should not be substitutes for on-site surveys required for environmental assessments. Current research projects and new contributors continue to identify additional populations of species and locations of habitats of concern, as well as, enhance existing data. Such new information is incorporated into the Data Base as it becomes available.

Please contact me if you have further questions at 424-3592. Thank you for consulting the Natural Diversity Data Base. Also be advised that this is a preliminary review and not a final determination. A more detailed review may be conducted as part of any subsequent environmental permit applications submitted to DEP for the proposed site.

Sincerely,

  
Dawn M. McKay  
Biologist/Environmental Analyst 3

Cc: Julie Victoria  
NDDDB # 14916





STATE OF CONNECTICUT  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
FRANKLIN WILDLIFE MANAGEMENT AREA  
391 ROUTE 32  
NORTH FRANKLIN, CT 06254  
TELEPHONE: (860) 642-7239



December 1, 2006

Ms. Laurel Stegina  
Fitzgerald & Halliday, Inc.  
72 Cedar Street  
Hartford, Ct 06106

re: Improvements to the New Haven Rail Maintenance Facility in New Haven, CT

Dear Ms. Stegina:

Your request was forwarded to me on 11/30/06 by Dawn McKay of the Department of Environmental Protection's (DEP) Natural Diversity Data Base. Their records indicate that a threatened species, American kestrel, (*Falco sparverius*) occurs in the vicinity of this project site.

American kestrels nest in late March - April in open areas like woodland edges, parks, and open field habitat. They are cavity nesters and seek out abandoned woodpecker or flicker holes to nest. They catch and eat mice, voles, shrews and insects. They winter over much of the nesting range. Kestrels are cavity nesters and will nest in artificial nesting boxes that are placed in the area. Artificial nesting box plans will be provided at your request. Nesting boxes and silvicultural practices that maintain high densities of nesting and roosting cavities in trees with a minimum diameter of 30.5 cm will benefit this species.

If this work will be conducted in any American kestrel habitat, the Wildlife Division recommends that a ornithologist familiar with the habitat requirements of these species conduct surveys. A report summarizing the results of such surveys should include habitat descriptions, avian species list and a statement/resume giving the ornithologist's qualifications. The DEP doesn't maintain a list of qualified ornithologists. A DEP Wildlife Division permit may be required by the ornithologist to conduct survey work, you should ask if your ornithologist has one. The results of this investigation can be forwarded to the Wildlife Division and, after evaluation, recommendations for additional surveys, if any, will be made.

The Wildlife Division has not been provided with details or a timetable of the work to be done. Consultation with the Wildlife Division should not be substituted for site-specific surveys that may be required for environmental assessments. Please be advised that should state permits be required or should state involvement occur in some other fashion, specific restrictions or conditions relating to the species discussed above may apply. In this situation, additional evaluation of the proposal by the DEP Wildlife Division should be requested. If you have any additional questions, please feel free to contact me (860-642-7239). Thank you for the opportunity to comment.

Sincerely,

A handwritten signature in black ink, appearing to read "Julie Victoria".

Julie Victoria  
Wildlife Biologist  
Franklin Swamp Wildlife Management Area  
391 Route 32  
N. Franklin, CT 06254

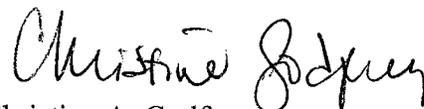
cc: NDDB - 14916



## MEMORANDUM FOR THE RECORD

SUBJECT: Jurisdictional Determination: CT DOT – New Haven Rail Yard – Facilities Improvements; New Haven, Connecticut; File No. NAE-2007-1580

1. CT DOT applied to fill 0.23 acres of wetland to construct a rail yard test track facility at the existing New Haven Rail Yard facility in New Haven, Connecticut. A review of wetlands delineation and wetlands functions and values assessment information by Susan Lee, Project Manager, CENAE-R-PEB, in coordination with Michael Sheehan, Sr. Wetlands Scientist, CENAE-R-PT on March 21, 2007 and May 24, 2007 verified that the PEM (marsh) wetland is isolated with no defined inlet or outlet. It is not hydrologically connected to any other wetland areas. There are no adjacent, bordering, contiguous or neighboring waters or wetlands at the site.
2. The determination of isolation was based on the following information: WETLANDS REPORT (attached) dated MARCH 2007 prepared by PB Americas, Inc., Fitzgerald & Halliday, Inc., supplemental information provided by e-mail (attached) dated May 24, 2007 from Fitzgerald & Halliday, Inc., aerial photos, and historic and current development information.
3. The Court ruling concerning Clean Water Act jurisdiction over isolated waters was Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers, No. 99-1178 (January 9, 2001) (“SWANCC”). The court concluded, “the ‘Migratory Bird Rule’ is not fairly supported by the CWA.” The Corps should not rely on the use of waters or wetlands as habitat by migratory birds as the only basis for jurisdiction.
4. The New Haven Rail Yard - Facilities Improvements wetlands site is clearly non-navigable, isolated and intrastate. In this particular case, there does not appear to be a reasonable nexus with interstate commerce. Also, the use, degradation or loss of this wetland will not affect other waters of the United States or affect interstate or foreign commerce.
5. This wetland should not be considered a water of the United States and there are no other jurisdictional waters or wetlands on the site. The file should be closed because there is no Federal jurisdiction.



Christine A. Godfrey  
Chief, Regulatory Division



**INFORMATION SHEET**  
**DETERMINATIONS OF NO JURISDICTION FOR ISOLATED, NON-NAVIGABLE, INTRA-STATE WATERS**  
**RESULTING FROM U.S. SUPREME COURT DECISION IN SOLID WASTE AGENCY OF NORTHERN COOK**  
**COUNTY V. U.S. ARMY CORPS OF ENGINEERS**

DISTRICT OFFICE: NEW ENGLAND DISTRICT  
 FILE NUMBER & APPLICANT: NAE-2007-1580

REGULATORY PROJECT MANAGER: Susan Lee Date: 05/31/2007

PROJECT REVIEW/DETERMINATION COMPLETED: In the office Y Date: 05/31/2007  
 At the project site N Date: \_\_\_\_\_

**PROJECT LOCATION INFORMATION:**

State: CT  
 County: New Haven  
 Center coordinates of site by latitude & longitudinal coordinates: 41.2954598, -72.9251003  
 Approximate size of site/property (including uplands & in acres): 100 acres +/-  
 Name of watershed or watershed: Quinnipiac

**SITE CONDITIONS:**

Type of aquatic resource <sup>1</sup>	0-1 ac	1-3 ac	3-5 ac	5-10 ac	10-25 ac	25-50 ac	> 50 ac	Linear feet	Unknown
Lake									
River									
Stream									
Dry Wash									
Mudflat									
Sandflat									
Wetlands	X								
Slough									
Prairie pothole									
Wet meadow									
Playa lake									
Vernal pool									
Natural pond									
Other water (identify type)									

<sup>1</sup>Check appropriate boxes that best describe type of isolated, non-navigable, intra-state water present and best estimate for size of non-jurisdictional aquatic resource area.

Migratory Bird Rule Factors <sup>1</sup> :	If Known		If Unknown Use Best Professional Judgment		
	Yes	No	Predicted to Occur	Not Expected to Occur	Not Able To Make Determination
Is or would be used as habitat for birds protected by Migratory Bird Treaties?	✓			X <i>MS</i>	
Is or would be used as habitat by other migratory birds that cross state lines?	✓			X <i>MS</i>	
Is or would be used as habitat for endangered species?				X	
Is used to irrigate crops sold in interstate commerce?		X			

<sup>1</sup>Check appropriate boxes that best describe potential for applicability of the Migratory Bird Rule to apply to onsite, non-jurisdictional, isolated, non-navigable, intra-state aquatic resource area.

TYPE OF DETERMINATION: Preliminary \_\_ Or Approved X  
 ADDITIONAL INFORMATION SUPPORTING NJD (e.g., paragraph 1 – site conditions; paragraphs 2-3 – rationale used to determine NJD, including information reviewed to assess potential navigation or interstate commerce connections; and paragraph 4 – site information on waters of the U.S. occurring onsite):





Datum: NAD-83  
UTM Zone: 18  
UTM Northing: 4573633  
UTM Easting: 673726  
Latitude: 41.295459792  
Longitude: -72.9251003344

State: Connecticut  
County: New Haven COUNTY  
Township:  
Range:  
Section: -99999999  
Congressional District: 903  
Watershed: 1100004  
Waterway:  
Baseline:  
Meridian:

Action ID: NAE-2007-1580--2

Description:

Comments: New Haven Rail Yard - JD

5/24/07 - ERS reviewed initial info; confirming isolated status; need additional wetlands assessment info.

5/24/2007 - ERS concurs isolated.

Begin Date: 5/18/2007



## **State Historic Preservation Office Coordination**





Connecticut Commission on Culture & Tourism

November 28, 2006

Mr. James H. Norman  
State Design  
ConnDOT  
2800 Berlin Turnpike  
Newington, CT

Historic Preservation  
& Museum Division

59 South Prospect Street  
Hartford, Connecticut  
06106

(v) 860.566.3005  
(f) 860.566.5078

Subject: Stores Facility – Building 10  
New Haven Rail Yard  
New Haven, CT  
ConnDOT #301-0088

Dear Mr. Norman:

The State Historic Preservation Office has reviewed the above-named project. This office notes that the Stores Facility (Building 10) possesses historic importance as a contributing resource to the New Haven Rail Yard, which is eligible for the National Register of Historic Places.

In the opinion of the State Historic Preservation Office, the proposed modification and subsequent demolition will effect the historic integrity of the Stores Facility (Building 10). However, this office believes that the proposed actions will constitute no adverse effect on Connecticut's cultural heritage. This comment is conditional upon the professional implementation of the following mitigative measure:

- o Prior to project-related activities, ConnDOT shall document the Stores Facility (Building 10) to the professional standards of the State Historic Preservation Office. Documentation shall consist of narrative text, photographs and/or high-quality digital images (exterior and interior perspectives and pertinent details), an index of photographs, and a photographic site plan. Final documentation shall be provided to the State Historic Preservation Office for permanent archiving and public accessibility.

For further assistance please contact Dr. David A. Poirier, Staff Archaeologist.

Sincerely,

J. Paul Loether  
Division Director and Deputy  
State Historic Preservation Officer

cc: Ms. Cynthia Holden/ConnDOT

FROM THE DESK OF JAMES H. NORMAN	
NOV 30 2006	
HIGHWAY	
FACILITIES	✓
PROJ. DEVELOPMENT	✓

RCM





Connecticut Commission on Culture & Tourism

Historic Preservation  
& Museum Division

August 10, 2006

Mr. Keith T. Hall  
Environmental Planning  
ConnDOT  
2800 Berlin Turnpike  
Newington, CT

Subject: New Haven Rail Yard  
New Haven, CT

59 South Prospect Street  
Hartford, Connecticut  
06106

(v) 860.566.3005  
(f) 860.566.5078

Dear Mr. Hall:

The State Historic Preservation Office acknowledges receipt of the HAER-quality narrative text and photographic images provided by the Public Archaeology Survey Team Inc. concerning the above-named project. This office believes that the submitted materials are consistent with our documentation standards and succinctly document the historic, architectural and engineering aspects of the New Haven Rail Yard. We further understand that the National Park Service has reviewed and accepted the documentation materials.

The State Historic Preservation Office has transferred the documentation materials to the Thomas J. Dodd Research Center at the University of Connecticut (Storrs) for permanent archiving and public accessibility.

In the opinion of the State Historic Preservation Office, ConnDOT has professionally satisfied all of the mitigative measures noted in the Memorandum of Agreement ratified for the New Haven Rail Yard. This office appreciates ConnDOT's efforts to professionally manage and document Connecticut's cultural heritage.

This comment updates and supersedes all previous correspondence for the proposed undertaking. For further information please contact Dr. David A. Poirier, Staff Archaeologist.

Sincerely,

J. Paul Loether  
Division Director and Deputy  
State Historic Preservation Officer

cc: Ms. Mary Harper/PAST





U.S. Department  
of Transportation  
**Federal Transit  
Administration**

REGION II  
Connecticut  
New Jersey  
New York  
Virgin Islands

One Bowling Green  
Room 429  
New York, NY 10004-1415  
212-668-2170  
212-668-2136 (Fax)

December 23, 1999

Mr. Mark D. Neri  
Assistant Rail Administrator  
Bureau of Public Transportation  
Connecticut Department of Transportation  
2800 Berlin Turnpike, P.O. Box 317546  
Newington, Connecticut 06131-7546

Re: Memorandum of Agreement for The  
New Haven Rail Yard and Reconstruction of  
The New Haven Interlocking Projects

Dear Mr. Neri:

Enclosed is a copy of the fully executed Memorandum of Agreement (MOA) for the above-referenced project. The Advisory Council on Historic Preservation's acceptance of the MOA completes the requirement of Section 106 of the National Historic Preservation Act and the Council's regulations.

Sincerely,

Irwin B. Kessman, Director  
Office of Planning and Program Development

FROM THE DESK OF CYNTHIA S. HOLDEN			
JUN 07 2007			
	<input checked="" type="checkbox"/>	PLS. DO NOT SEE	
KEITH T. HALL			
MARK W. ALEXANDER			
PAUL N. CORRENTE			
STEPHEN V. DELPAPA			

RECEIVED  
DEC 27 1999  
OFFICE OF RAIL

MEMORANDUM OF AGREEMENT

AMONG

THE FEDERAL TRANSIT ADMINISTRATION  
FEDERAL RAILROAD ADMINISTRATION  
NATIONAL RAILROAD PASSENGER CORPORATION  
CONNECTICUT DEPARTMENT OF TRANSPORTATION  
CONNECTICUT STATE HISTORIC PRESERVATION OFFICE  
AND ADVISORY COUNCIL ON HISTORIC PRESERVATION

FOR

THE RECONSTRUCTION OF THE RAIL MAINTENANCE  
AND STORAGE FACILITIES  
IN THE NEW HAVEN RAIL YARD

AND

THE RECONSTRUCTION OF THE NEW HAVEN INTERLOCKING  
IN NEW HAVEN, CONNECTICUT

WHEREAS, the Federal Transit Administration (FTA) proposes reconstruction of the rail car storage and maintenance facilities in the New Haven Rail Yard in the City of New Haven, Connecticut, which includes demolition of eleven existing buildings, excavation and removal, where necessary, of existing buried foundations of removed buildings, and construction of new rail car storage and maintenance facilities within the rail yard.

WHEREAS, the National Railroad Passenger Corporation (AMTRAK) proposes reconstruction of the New Haven Interlocking trackwork east and west of New Haven Station, with federal funds provided through the Federal Railroad Administration (FRA). The reconstruction includes removal of the existing Interlocking control building and corresponding apparatus contained within, and existing trackwork and site features.

WHEREAS, FTA, FRA, AMTRAK, the Connecticut Department of Transportation (ConnDOT), and the Connecticut State Historic Preservation Office (SHPO) have determined that the proposed demolition and reconstruction activities associated with these rail yard and interlocking improvements will have an adverse effect upon the historical and archaeological resources located within the yard and main line properties affected.

WHEREAS, SHPO, FTA, and FRA concur that the New Haven Rail Yard is a significant example of Connecticut's late 19th and early 20th century railroad related technology, which meets the eligibility criteria for the National Register of Historic Places. SHPO, FTA, and FRA have requested comments from the Advisory Council on Historic Preservation (ACHP), pursuant to Section 106 of the National Historic Preservation Act (16 U.S.C. 470f) and its implementing regulations, "Protection of Historic and Cultural Properties (36 CFR Part 800)."

NOW, THEREFORE, FTA, FRA, AMTRAK, SHPO and ACHP agree that the undertakings proposed by FTA and AMTRAK shall be implemented in accordance with the following stipulations, in order to take into account the effect of the proposed project on the historic rail yard:

#### Stipulations

FTA and FRA will insure that the following measures are carried out:

1. Prior to any demolition or construction activities in the New Haven Rail Yard, ConnDOT shall record the existing buildings and facilities in the rail yard, including the interlocking relay switches and control panel located in the existing control building, to the "Narrative Format" standards of the Historic American Engineering Record (HAER). Unless otherwise agreed to by the National Park Service (NPS), ConnDOT shall ensure that all documentation is completed and accepted by HAER prior to demolition. Archival copies of the documentation shall be provided to HAER and SHPO.
2. ConnDOT shall contact the Smithsonian Institution regarding their potential acquisition and curation of the existing Interlocking relay switching and control panels, which are located in the existing control building.
3. ConnDOT shall contact all of Connecticut's trolley and railroad museums regarding the potential for salvage and adaptive use of any railroad-related structures and/or material from the New Haven Rail Yard, and offer them a reasonable time frame to investigate and acquire.
4. ConnDOT shall prepare a brief history of the New Haven Rail Yard and the proposed reconstruction program, including pertinent plans and photographs, and submit it to the Society For Industrial Archeology, New England Chapters Newsletter.

5. ConnDOT shall develop a public-oriented information program which focuses on the history and technology of the New Haven Rail Yard. This shall include, as a minimum, a public-oriented report, brochure, slide presentation, and/or interpretative exhibit.
6. ConnDOT shall, in coordination with the SHPO, develop an archaeological monitoring program for the New Haven Rail Yard. The monitoring program shall be put in place for the former roundhouse and turntable locations. The monitoring program shall be implemented for any underground exploration programs, such as boring programs for geotechnical or environmental investigations. Requirements for implementing the monitoring program, and conducting archaeological investigations where feasible, shall be included in the contract specifications for any demolition and/or construction contracts affecting the roundhouse/turntable areas. The monitoring program shall consist of an evaluation of the pertinent soil and groundwater contamination data, in consideration of health and safety concerns related to on-site archaeological investigations. The monitoring program shall consider and evaluate the application of alternate approaches for data collection, on a site-specific basis. Where feasible, the archaeological monitoring program shall be carried out in accordance with SHPO's Environmental Review Primer for Connecticut's Archaeological Resources.

Execution of this Memorandum of Agreement evidences that FTA and FRA have afforded ACHP a reasonable opportunity to comment on this project and its effects on the historic resource, and that FTA and FRA have taken into account the effects of their undertakings on the historic structures and facilities.

FEDERAL TRANSIT ADMINISTRATION:

By:

*Stephen A. Thompson*

Date:

11/05/99

FEDERAL RAILROAD ADMINISTRATION:

By:

*Jolene M. Molitoris*  
Jolene Molitoris, Administrator

Date:

9/25/96

NATIONAL RAILROAD PASSENGER CORPORATION:

By:

*David J. Carol*  
David J. Carol  
Vice President, High Speed Rail

Date:

9/8/96

CONNECTICUT STATE HISTORIC PRESERVATION OFFICE:

By:

*John Shannahan*  
John Shannahan  
State Historic Preservation Officer

Date:

8/6/96

Concurred:

CONNECTICUT DEPARTMENT OF TRANSPORTATION:

By:

*Lawrence J. Forbes*  
Lawrence J. Forbes  
Rail Administrator

Date:

7-20-96

Accepted:

ADVISORY COUNCIL ON HISTORIC PRESERVATION:

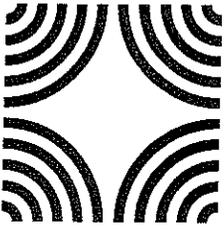
By:

*[Signature]*  
Executive Director, ACHP

Date:

12/2/99





RECEIVED

APR 9 2008

April 4, 2008

ENVIRONMENTAL PLANNING  
DIVISION

Historic Preservation  
and Museum Division

One Constitution Plaza  
Second Floor  
Hartford, Connecticut  
06103

860.256.2800  
860.256.2763 (f)

Mr. Donald Burns  
Federal Transit Administration  
One Bowling Green  
Room 429  
New York, NY 10004-1415

Subject: New Haven Rail Yard  
New Haven, CT  
ConnDOT #301-0088

FROM THE DECK OF CYNTHIA C. HOLDEN			
APR 4 2008			
KEITH T. HULL	✓		PLS. SEE ME
MARK W. ALEXANDER			
PAUL N. CORRENTE			
STEPHEN V. DELPAPA			

Dear Mr. Burns:

The State Historic Preservation Office has undertaken extensive coordination with the Connecticut Department of Transportation regarding the above-named project. In particular, a Memorandum of Agreement was ratified by the Federal Highway Administration, ConnDOT, and our office with respect to historic and archaeological resource-related impacts. We further note that all of the mitigative measures stipulated within the Memorandum of Agreement have been professionally completed.

In the opinion of the State Historic Preservation Office, no further historic preservation coordination concerning the New Haven Rail Yard is required vis-à-vis the National Historic Preservation Act.

For further assistance, please contact Dr. David a. Poirier, Staff Archaeologist.

Sincerely,

Karen Senich  
State Historic Preservation Officer

cc: Mr. Edgar Hurle/ConnDOT



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**APPENDIX B: NOISE ASSESSMENT TECHNICAL  
MEMORANDUM AND ASSOCIATED FTANOISE SPREADSHEETS**

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**FEDERAL TRANSIT ADMINISTRATION  
GENERAL NOISE ASSESSMENT**

**New Haven Rail Maintenance Facility Improvements**

**Prepared under contract to:**

**PB AMERICAS**

**For:**

**THE CONNECTICUT DEPARTMENT OF TRANSPORTATION  
State Project No. 301-0088**

**By:**

**FITZGERALD & HALLIDAY, INC.  
72 Cedar Street  
Hartford, Connecticut 06106**



**April 2008**



**Federal Transit Administration General Noise Assessment  
for  
New Haven Rail Maintenance Facility Improvements  
New Haven, CT**

**PROJECT BACKGROUND**

The New Haven Line of the Metro-North Railroad (MNR) is one of nation's premier commuter rail lines, as well as one of its busiest. The Connecticut portion of the New Haven Line runs from the Connecticut-New York state line to Union Station in New Haven. The New Haven Rail Yard (NHRY), which functions as an existing rail yard for MNR, is located in the Long Wharf section of the city of New Haven, in close proximity to New Haven Harbor to the east and Downtown New Haven to the northwest. Interstate 95 (I-95) and Interstate 91 (I-91), are two major interstate transportation corridors located east and northeast respectively of the New Haven Rail Yard.

The Proposed Action, which consists of a series of improvements to the NHRY, is located on approximately 79 acres of land currently owned by the Connecticut Department of Transportation (ConnDOT). The Proposed Action site is roughly bounded by a study area roughly bounded by Union Avenue to the west, Cedar and Hallock Streets to the south, Church Street Extension and Brewery Street to the east, and Route 34 to the north.

The Proposed Action will provide the facilities to service the new M-8 fleet of rail cars, as well as the existing M-2, M-4, and M-6 rail cars. As the existing fleet of aging rail cars is phased out, ConnDOT will replace them with the next generation of rail cars (M-8s). The first deliveries of these new rail cars will take place in May 2009. The M-2 fleet (dating to the 1970s) was only designed to operate for 30 years. The M-8 cars require different maintenance facilities than the M-2s. The Proposed Action incorporates both new facilities and improvements to existing facilities.

To provide for the new maintenance needs of the M-8 rail cars, improvements (including new equipment) are needed at the NHRY. Additional yard space is also critically important for the acceptance and ultimate storage of the new M-8 cars. By 2030, with increasing M-8 use, space will be needed for 120 additional electric multiple unit (EMU) rail cars.

The proposed improvements will transform the 79-acre NHRY into a coordinated facility, providing for the efficient and effective storage, dispatching, inspection, and maintenance of the M-8 rail cars, as well as existing rail cars. The Proposed Action (i.e., the NHRY improvements) includes:

- Laying down twenty-five new storage yard tracks,
- A two-track, 10-car service and inspection (S&I) shop,

- A component change-out shop with three tracks capable of holding thirteen rail cars and adjacent support shops,
- New wheel true shops,
- A maintenance-of-way building with offices and shops,
- A rail car washer,
- A heavy repair and paint shop, and
- A new parking structure and employee overpass.

To assess the potential for project-related noise impacts to nearby noise sensitive land uses, the Federal Transit Administration's (FTA) General Noise Assessment Spreadsheet (FTANOISE) and associated FTA guidance manual, *Transit Noise and Vibration Impact Assessment* (FTA-VA-90-103-06, May 2006) was implemented. This Technical Memorandum describes how the FTA General Noise Assessment was conducted for this project.

## **FTA GENERAL NOISE ASSESSMENT METHODOLOGY**

The FTA General Noise Assessment procedure involves noise predictions commensurate with the level of detail available in the early planning stages of major investment transit projects. Estimates are made of project noise levels and of existing noise conditions to determine potential impacts on nearby noise sensitive land uses. The assessment is conducted using FTANOISE, a spreadsheet program developed by the consulting firm of Harris Miller Miller & Hanson for the FTA based on detailed analysis of noise impacts from various transit related activities worldwide. It includes complex formulae that calculate predicted noise levels from input criteria entered by the user.

The NHRY is a large *existing* facility which already generates noise. There will be no expansion of the boundary of the existing property, and there will be no work outside of the property. Additionally, the Proposed Action consists of a defined set of new and improved facilities. Therefore, for the purposes of this noise analysis, a central area of noise generated by the Proposed Action (i.e., that location where the bulk of activity will be located, rather than the outer boundary of the existing NHRY) was selected from which to measure distances to potential noise sensitive land uses. This central area (primary center), where most of the rail yard noise is generated under existing conditions and future conditions (from the Proposed Action), lies northeast of the Church Street South Extension (east of Union Avenue) in the vicinity of the Independent Wheel Truer. This area is close to (just north of) the electric multiple unit (EMU) shop and the Service and Inspection (S&I) shop, and just northwest of the existing Union Station and its associated activities. There is also noise from existing roadways in this central area, particularly with Union Avenue to the west and Church Street South extension to the south.

The loop tracks were also identified as a major contributor to noise activity. However, they are, relatively speaking, far from the identified primary center of noise generating activity on the rail yard. Therefore, a secondary center of noise generating activity, in the midst of the loop tracks, was also identified in the noise analysis.

To estimate existing noise levels, the user is prompted by FTANOISE for specific data related to existing noise sources in the project area depending on the type of noise source present (i.e., rail corridor, highway corridor, bus facility, parking garage etc.). Data inputs include distance from noise source to receiver, number of hourly operations, and number of intervening structures (between noise source and receiver), among others. Additionally, the user is prompted for the Land Use Category (defined below) associated with the noise sensitive land use being evaluated. The prediction of future (2030) noise levels resulting from the project also requires the user to input project specific data such as distance from project to receiver, number of daytime and nighttime hourly operations, and number of intervening structures, among others. To determine the actual noise impact at a specific noise sensitive land use, the resulting existing noise levels and future project noise levels are compared using FTA noise impact criteria reported in the FTA guidance manual (FTA-VA-90-103-06, May 2006).

FTANOISE results (spreadsheets) for both existing (2006) and future (2030) conditions at each of the noise sensitive land uses are appended to this Technical Memorandum. Also included in the appendix are marked up maps showing the distance from the primary and the secondary centers of noise generating activity of the Proposed Action to each noise sensitive receptor (screening distances), as well as distances from noise sensitive receptors to noise sources. This information was used as input for FTANOISE.

## **NOISE SENSITIVE LAND USE**

There are three categories of noise sensitive land uses defined by FTA. A Category 1 Land Use is generally defined as a tract of land where quiet is an essential element in its intended purpose, such as an outdoor concert pavilion or a National Historic Landmark where outdoor interpretation routinely takes place. Category 2 Land Uses include residences and buildings where people sleep, and Category 3 Land Uses include institutional land uses with primarily daytime and evening use such as schools, churches, and libraries. Parklands with both active and passive recreational use are also considered to be Category 3 Land Uses (FTA-VA-90-103-06, May 2006).

Land use within the project vicinity has been evaluated for this noise analysis and is characterized by a mix of industrial, commercial, transportation, and residential uses. According to the noise screening procedure contained in Chapter 4 of the FTA guidance manual *Transit Noise and Vibration Impact Assessment* (FTA-VA-90-103-06, May 2006), only those noise sensitive land uses located within a distance of 1,000 unobstructed feet (and 650 feet obstructed with intervening buildings and structures) of the proposed NHRY improvements should be considered in the FTANOISE analysis. The noise screening distance of 1,000 feet unobstructed (and 650 feet obstructed) was used based on guidance relative to rail yards and shops contained in Chapter 4 of the FTA manual.

A site visit was conducted on October 27, 2006 to identify and categorize land uses (receptors) considered to be noise-sensitive within 1,000 feet of the proposed project and to develop a baseline for the existing noise environment at the site. Based on this site

visit, and by overlaying the 1,000-foot (and 650-foot) noise screening buffer on an aerial photo of the project site, a total of four residential, or Category 2 Land Uses, and one church, or Category 3 Land Use, were identified within 1,000 feet (unobstructed) of the Proposed Action. No noise sensitive receptors were found within 650 feet (obstructed), measured from the primary center and the secondary center of noise generating activity.

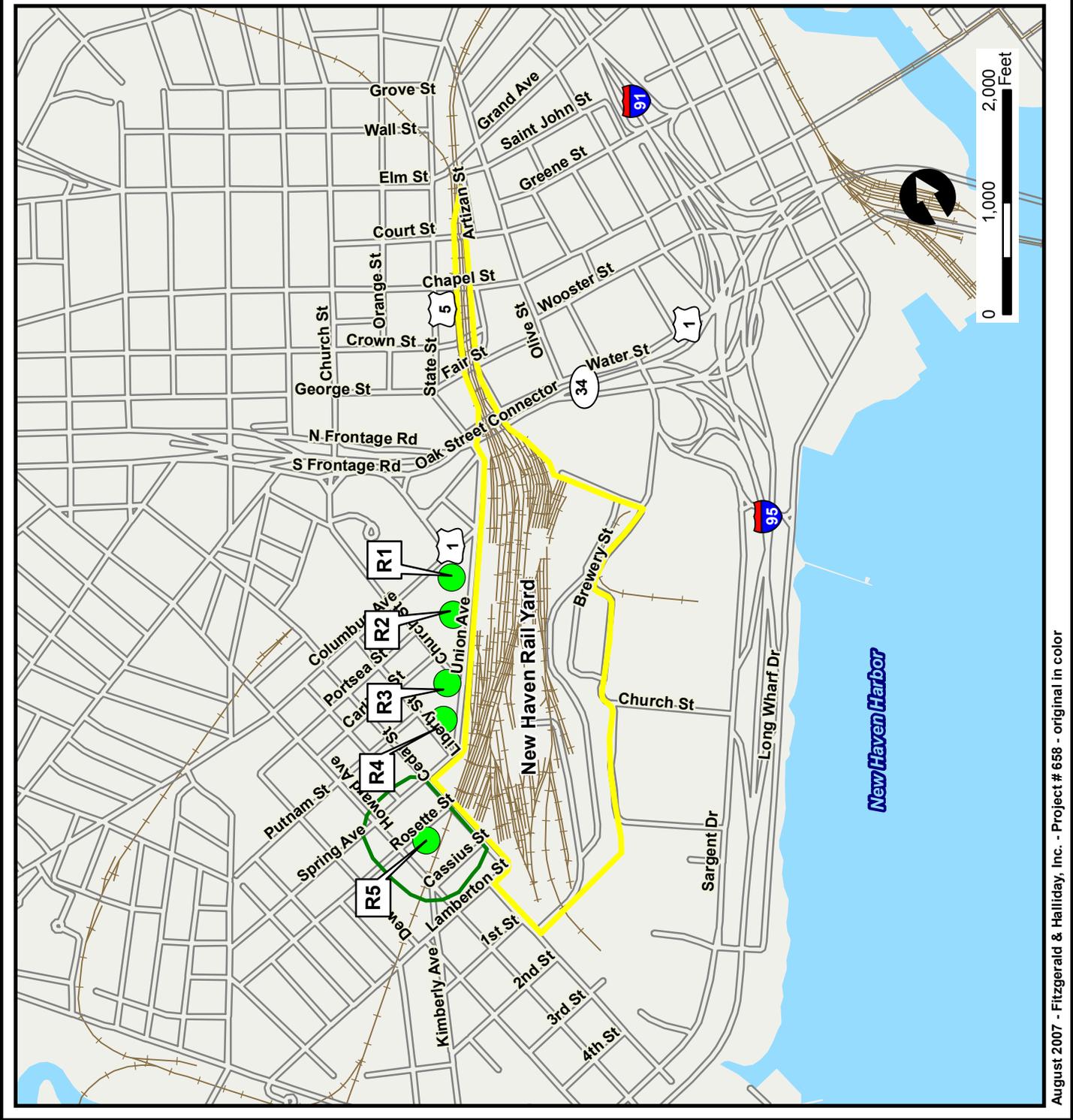
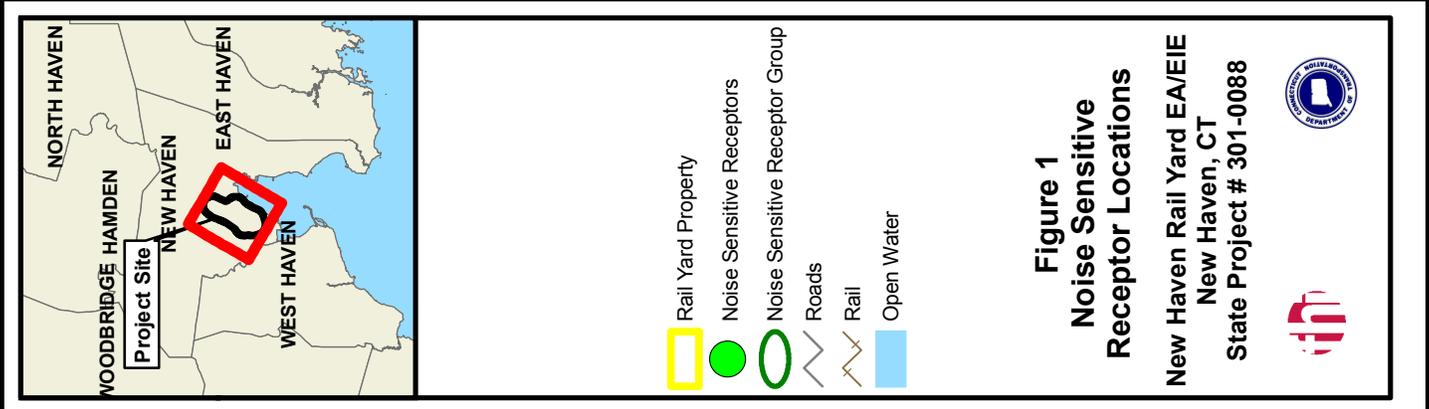
These five noise sensitive receptors, labeled R1 through R5, are depicted in Figure 1. Receptor 1 (R1), R2, R4, and R5 are Category 2 Land Uses, and R3 is a Category 3 Land Use. The receptor labeled as R1 is the Robert T. Wolfe apartment building. It is a seven-story apartment building that fronts Union Avenue and is located across the street from Union Station. The receptor labeled R2 is the Church Street South Apartments, a planned development with residences and its own convenience stores. The residential units are each two or three stories. Receptor R3 is the Hill Seventh Day Adventist Church, located at the southwest corner of Union Avenue and Church Street. The receptor labeled R4 is a cluster of residential homes and apartment buildings located a bit farther south of the Church Street and Union Avenue intersection. These residential homes and apartment buildings are two and three stories in height. R1-R4 are within 1,000 feet (unobstructed) of the primary center of noise generating activity. R5, a cluster of residences along Hallock Avenue, is located within 1,000 feet (unobstructed) from the secondary center of noise generating activity. R5 is comprised of mostly two-story, single and multi-family dwellings.

## **DETERMINATION OF EXISTING (2006) NOISE LEVELS**

In February 2007, ConnDOT conducted a noise analysis entitled *New Haven Rail Yard Locomotive Fueling Facility Noise and Vibration Impact Assessment*. This noise analysis was specific to the Fueling Facility, rather than the entire scope of NHRY improvements included in the Proposed Action. Therefore, a separate noise analysis was conducted specifically for this Proposed Action. Existing noise levels, for the Proposed Action, were estimated using the FTA General Noise Assessment Spreadsheet (FTANOISE) in conjunction with the FTA guidance manual. To conduct the analysis, existing noise sources within the project area were identified and the distance from each noise source to each sensitive receptor was determined.

### **Existing Noise Sources**

In general, the NHRY is located in a highly urbanized area, surrounded by many noise sources including Interstate 95, approximately 1,855 feet to the east, and a busy industrial and commercial area immediately to the east. The NHRY itself includes a commuter rail station and a parking garage. Other noise sources include the City of New Haven's police station, immediately to the northwest of the rail yard, and the Route 34 connector to I-95, just north of the rail yard. There are also places of worship, multi-family houses, apartments and other residential units to the west.



Although there are many noise sources in this area of New Haven, there are a few which stand out for the purposes of this analysis. Union Avenue and Church Street South provide access to the rail yard. These two roadways are located between the Proposed Action and the noise receptors. Therefore, traffic along these adjacent city streets (Union Avenue and Church Street South) is considered a prominent source of existing noise for this analysis. Another important existing noise source is the existing NHRV itself.

One particular element of the rail yard, the loop tracks, were identified as particularly noisy and, therefore, they were also singled out as a noise source. There have been a few noise-related complaints about the noise generated from these loop tracks from residents living along Hallock Avenue. Cars or joined on the loop tracks to form or “build” a train, and this process generates noise.

All trains moving through the rail yard are limited to a speed of 10 mph, although trains moving along the loop tracks are likely to be moving no more than 5 mph. On average, there are two diesel trains and two or three EMUs moving into and out of the loop tracks each day *and* each night.

### Roadways

According to the FTA guidance manual, Union Avenue and Church Street South are designated as “Other Roadways” for the purpose of estimating existing noise exposure at nearby noise sensitive land uses. “Other Roadways” are defined as “Parkways with traffic at 55 mph, but without trucks, and city streets with the equivalent of 75 or more heavy trucks per hour and 300 or more medium trucks per hour at 30 mph.”

The 2006 average annual daily traffic (AADT) volumes for Union Avenue and Church Street South were derived by converting peak hour traffic counts. The greatest peak hour (p.m. peak for both Union Avenue and Church Street South) was divided by 10% for each street. Using this methodology, Union Street carried an AADT of 8,500 vehicles and Church Street South carried an AADT of 8,300 vehicles.

From these calculated AADT’s, the average number of vehicles per hour during daytime hours and nighttime hours was then derived for each street and was used as input into FTANOISE in order to calculate existing noise levels at each of the identified noise sensitive receptors. The average number of vehicles per hour for each street for both daytime and nighttime hours was derived by assigning 80% of the AADT to the daytime and 20% to the nighttime, and then dividing each AADT fraction by the number of hours comprising the respective daytime (7 A.M. to 10 P.M.) and nighttime (10 P.M. to 7 A.M.) time periods. The results are presented in Table 1: Average Number of Vehicles per Hour on Streets with the Project Study Area.

**Table 1:  
Average Number of Vehicles per Hour  
on Streets within the Project Study Area**

<b>Street Name</b>	<b>Average Number of Vehicles Per Hour</b>	
	<b>Daytime Hours (7AM to 10 PM)</b>	<b>Nighttime Hours (10 PM to 7 AM)</b>
Union Avenue	453	188
Church Street South	442	184

Source: Fitzgerald & Halliday, Inc. 2007.

### Rail Yard

The existing NHRY constitutes another important noise source in the project study area. The number of trains per hour in the daytime and the number of trains per hour in the nighttime were used as input to the FTANOISE to calculate the noise generated by the rail yard. Rail yard characteristics, such as the type of track, whether there are barriers, aerial structures, and intervening rows were also input into the FTANOISE analysis.

Data was obtained through coordination with ConnDOT and PB Americas project engineers and used as input for the noise analysis. The NHRY currently processes up to seven trains per hour during the daytime and up to nine trains per hour during the nighttime. For this analysis, it was assumed that these numbers would not decrease over time. It was assumed that the tracks in the rail yard are a mix of jointed and welded rail. The only embedded rail will be in the new shops, which was assumed for the 2030 future conditions. For a conservative (“worst case”) scenario, it was also assumed that there were no aerial structures, barriers, or intervening rows for either the existing or future conditions.

### Loop Tracks

The loop tracks are where trains lay over, are stored, and where cars are joined, or “built” to form a train. These processes generate noise.

All trains moving through the rail yard are limited to a speed of 10 mph, although trains moving along the loop tracks are likely to be moving no more than 5 mph. On average, there are two diesel trains and two or three EMUs moving into and out of the loop tracks each day *and* each night.

### **Existing Noise Levels**

Noise from nearby streets and the rail yard all contribute to existing noise levels. Traffic volumes (average number of vehicles hour, both in the daytime and the nighttime), automobile speed limits, trains per hour, and the distance between each noise source and each noise sensitive receptor were used as input in the FTANOISE model to estimate the existing noise levels at each of the four noise sensitive receptors. Existing (2006) noise

levels are expressed by FTANOISE as day-night sound level ( $L_{dn}$ ), which describes a receiver's cumulative noise exposure from all events over a full 24 hours, with events between 10 P.M. and 7 A.M. increased by 10 decibels to account for greater nighttime sensitivity to noise. The estimated existing noise levels at each of the four noise sensitive receptors are presented in Table 2: Estimated Existing (2006) Noise Levels.

**Table 2: Estimated Existing (2006) Noise Levels**

<b>Receptor</b>	<b>Site Location</b>	<b>Estimated Existing Noise Level (dBA <math>L_{dn}</math>)</b>	<b>Land Use Category</b>
R1	Robert T. Wolfe apartment building	59	2
R2	Church Street South Apartments	59	2
R3	Hill Seventh Day Adventist Church	53	3
R4	Residences south of Church Street South and Union Avenue intersection	52	2
R5	Residential cluster along Hallock Avenue	64	2

Source: Fitzgerald & Halliday, Inc., July 2007.

FTANOISE spreadsheets used to estimate existing (2006) noise levels at each of the five noise sensitive receptors are included in the appendix to this report. Marked up versions of the preferred NHRY concept are also included in the appendix which document the location of each noise sensitive land use as well as important distances used as input into FTANOISE.

### **DETERMINATION OF FUTURE (2030) PROJECT-ONLY NOISE LEVELS**

The Proposed Action includes installing twenty-five new storage yard tracks, a two-track, 10-car service and inspection (S&I) shop, a component change-out shop with three tracks capable of holding thirteen rail cars and adjacent support shops, new wheel true shops, an engineering building with offices and shops, a rail car washer, a heavy repair and paint shop, and a new parking structure and employee overpass.

As previously mentioned, through coordination with ConnDOT and PB Americas project engineers, seven trains per hour in the daytime and nine trains in the nighttime were used as input into the FTANOISE spreadsheet to estimate future (2030) project-only noise levels at nearby noise sensitive receptors. Although the number of trains may actually decrease, slightly, over time, a conservative approach was taken in this noise analysis.

Nine diesel trains and twelve EMUs would come in and out of the proposed storage tracks each day. These movements would be split evenly between night and day. New

diesel storage tracks are proposed to be equipped with standby power systems that will keep the coaches powered up even when the diesel trains are shut down, allowing the diesel trains to be shut down shortly after entering the storage tracks and started only shortly before leaving the storage tracks. These standby power systems will alleviate the noise generated by diesel trains during the overnight hours.

Future noise levels *strictly attributed* to the NHRY (i.e., excluding other noise sources in the project area) were predicted using FTANOISE for the five noise sensitive receptors located within the 1,000 foot noise screening buffer. Future noise levels at each of the five noise sensitive receptors, as predicted by FTANOISE, are presented in Table 3: Estimated Future (2030) Project-Only Noise Levels. Future noise levels, as shown in Table 3, reflect *only noise associated with the project by itself*.

**Table 3: Estimated Future (2030) Project-Only Noise Levels**

<b>Receptor</b>	<b>Site Location</b>	<b>Estimated Future Noise Level (dBA L<sub>dn</sub>)</b>	<b>Land Use Category</b>
R1	Robert T. Wolfe apartment building	53	2
R2	Church Street South Apartments	54	2
R3	Hill Seventh Day Adventist Church	48	3
R4	Residences south of Church Street South and Union Avenue intersection	53	2
R5	Residential cluster along Hallock Avenue	54	2

Source: Fitzgerald & Halliday, Inc., July 2007.

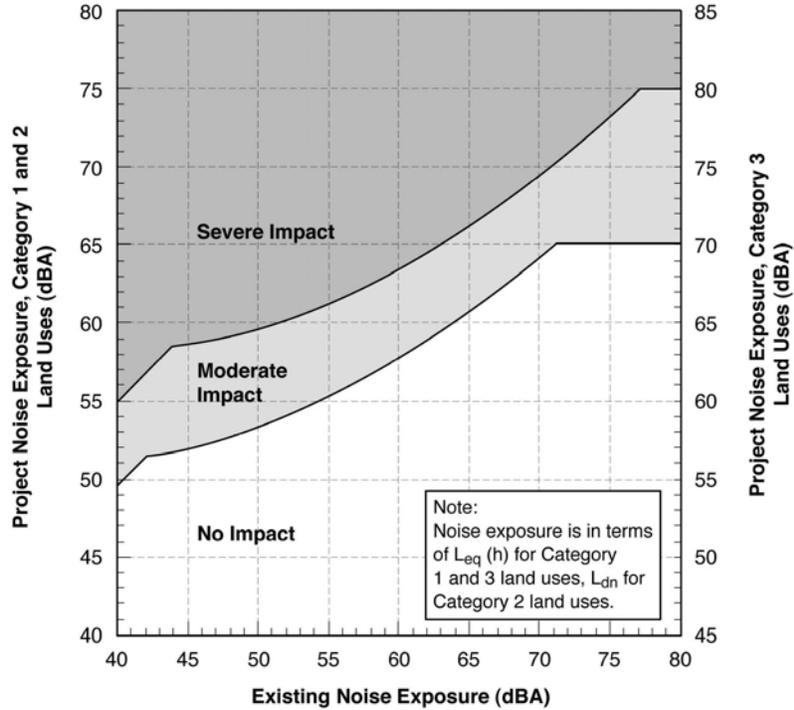
## **INTERPRETATION OF FTANOISE RESULTS**

To determine whether the Proposed Action will result in a noise impact at any one of the five noise sensitive receptors, a comparison of the existing (2006) outdoor noise levels (Table 2) and future (2030) outdoor noise levels resulting from the project (Table 3) is necessary. According to the FTA guidance manual, Figure 2: Noise Impact Criteria for Transit Projects (FTA May 2006), is used to facilitate this comparison.

To conduct the comparison, a vertical line is drawn that intersects the horizontal axis at the decibel level representative of the existing noise exposure (values taken from Table 2) for the specific noise sensitive receptor being compared. Similarly, a horizontal line is drawn that intersects a vertical axis at the decibel level representative of the project noise exposure (values taken from Table 3) for the same noise sensitive receptor. The vertical axis that is used depends on the Land Use Category of the noise sensitive receptor being evaluated. For this project, noise sensitive receptors 1, 2, 4, and 5 are residential land

uses, and are classified as Category 2 Land Uses. Noise sensitive receptor 3, a church, is a Category 3 land use.

**Figure 2: Noise Impact Criteria for Transit Projects**



Source: FTA, May 2006.

The left vertical axis of Figure 2 is used to represent the project noise exposure. The intersection of the existing noise exposure (vertically drawn line) with the project noise exposure (horizontally drawn line) represents the degree of project noise impact at that specific noise sensitive receptor. For instance, receptor #1 (R1) has an estimated existing (2006) noise exposure of 59 dBA  $L_{dn}$  (from Table 2) and a project noise exposure (2030) of 53 dBA  $L_{dn}$  (from Table 3). The intersection of these two noise levels when plotted on the graph illustrated in Figure 2 falls within the No Impact range. Table 4: Anticipated Noise Impact from the Proposed NHRY Project documents the results that are obtained when applying the aforementioned procedure to the five noise sensitive receptors.

For Category 2 Land Uses, noise impacts at specific noise sensitive receptors must also be evaluated in terms of cumulative noise, estimated by the addition of a project-related noise exposure (from Table 3) and the existing noise exposure (from Table 2). The four residential noise sensitive receptors, which are Category 2 Land Uses, were evaluated with respect to cumulative noise impact using Table 5: Noise Impact Criteria: Effect on Cumulative Noise Exposure, which has been reproduced directly from the FTA noise guidance manual. Category 3 Land Uses are not evaluated with respect to cumulative noise impacts, as these land uses are considered less sensitive to noise than Land Use Categories 1 and 2.

**Table 4: Anticipated Noise Impact from the Proposed NHRV Project**

Noise Sensitive Receptor	Existing (2006) Noise Levels	Future (2030) Project-Only Noise Levels	Result
R1	59 dBA ( $L_{dn}$ )	53 dBA ( $L_{dn}$ )	No Impact
R2	59 dBA ( $L_{dn}$ )	54 dBA ( $L_{dn}$ )	No Impact
R3	53 dBA ( $L_{dn}$ )	48 dBA ( $L_{dn}$ )	No Impact
R4	52 dBA ( $L_{dn}$ )	53 dBA ( $L_{dn}$ )	No Impact
R5	64 dBA ( $L_{dn}$ )	54 dBA ( $L_{dn}$ )	No Impact

Source: Fitzgerald & Halliday, Inc., July 2007.

**Table 5: Noise Impact Criteria: Effect on Cumulative Noise Exposure**

Noise Impact Criteria: Effect on Cumulative Noise Exposure			
$L_{dn}$ or $L_{eq}$ in dBA (rounded to nearest whole decibel)			
Existing Noise Exposure	Allowable Project Noise Exposure	Allowable Combined Total Noise Exposure	Allowable Noise Exposure Increase
45	51	52	7
50	53	55	5
55	55	58	3
60	57	62	2
65	60	66	1
70	64	71	1
75	65	75	0

Source: FTA, May 2006.

As previously mentioned, the existing noise exposure at site R1 is 59 dBA ( $L_{dn}$ ), and the project noise exposure is 53 dBA ( $L_{dn}$ ). According to the second column in Table 5, the allowable project noise exposure can be as high as 57 dBA ( $L_{dn}$ ) when the existing noise exposure (column one) is 59 dBA ( $L_{dn}$ ) before a cumulative noise impact is realized. Since the NHRV project noise exposure at receptor R1 (53 dBA ( $L_{dn}$ )) is well below the allowable project noise exposure for an existing noise exposure of 59 dBA ( $L_{dn}$ ), a cumulative noise impact will not occur at this residential noise sensitive receptor from the NHRV project. Similar results are also obtained when applying this method to noise sensitive receptors 2, 4, and 5, the other Category 2 noise sensitive receptors.

## MITIGATION

The project will not result in a noise impact to any of the identified noise sensitive land uses (receptors R1 through R5). There are no noise impacts resulting from the Proposed Action. As such, mitigation measures are not required as part of the project.

## CONSTRUCTION NOISE ASSESSMENT

The New Haven Rail Yard (NHRV) is situated in an urban area, with Interstate 95 and an industrial area to the east and Route 34 and the downtown central business district to the northwest. Union Station is located adjacent to the rail yard, with supporting land uses, such as parking garages nearby. The Hill residential neighborhood is to the south and west of the NHRV. Heavy equipment, vehicles, and construction activity creates noise which impacts nearby residential and other sensitive land uses, such as places of worship. During the construction period, continuous as well as intermittent (or impulse) noise will be experienced in the immediate project vicinity, which may be perceived by some nearby residents to be intrusive, annoying, and discomforting. For rail yards, noise sensitive land uses of particular concern are those within screening distances of 1000 feet (unobstructed by any buildings or other structures that would provide a buffer) or 650 feet (obstructed) of the noise source.

Noise from construction activities was evaluated for the Proposed Action in accordance with FTA Qualitative Noise Assessment procedures stipulated in Chapter 12 of FTA's *Transit Noise and Vibration Impact Assessment* (FTA-VA-90-1003-06, May 2006). A qualitative noise analysis was deemed appropriate for this project for several reasons:

- Construction is occurring at many locations within the rail yard and at varying times and for varying lengths of time.
- Ambient noise of the surrounding urban environment, coupled with existing rail yard operations, is already high and in effect will mask the construction noise.
- With the exception of pile driving, construction activity is anticipated to be of moderate intensity, including foundation work, building erection, track laying, earthwork and excavation, and materials transport.

Construction of the Proposed Action will begin in 2008 and be completed by 2020. Construction will occur in three phases:

- Phase I, 2008–2012 — storage tracks, west end of the rail yard, component change out shop, and independent wheel truer
- Phase II, 2012–2015 — east end of the rail yard
- Phase III, 2015–2020 — service and inspection shop, car wash, warehouse, parking garage

Table 6 provides typical noise emission levels in A-weighted decibels (dBA) 50 feet from various types of construction equipment. These are the types of construction equipment, among others, that will be used to demolish existing buildings and ancillary railroad

facilities, prepare the site, and construct the new rail yard buildings and associated improvements.

In general, noise levels from construction equipment are reduced by 6 dBA for each doubling of distance from the construction equipment noise source. For example, a dozer with a noise level of 85 dBA at 50 feet will have a noise level of 79 dBA at 100 feet, 73 dBA at 200 feet, 67 dBA at 400 feet, 61 dBA at 800 feet, and so forth. Buildings and other barriers located between a construction noise source and a sensitive noise receptor further reduce the intensity of construction noise.

**Table 6: Noise Emission Levels from Construction Equipment**

<b>Equipment</b>	<b>Typical Noise Level (dBA) 50 ft. from Source</b>
Air Compressor	81
Backhoe	80
Ballast Equalizer	82
Ballast Tamper	83
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Derrick	88
Crane, Mobile	83
Dozers	85
Generator	81
Graders	85
Impact Wrench	85
Jack Hammer	88
Loader	85

<b>Equipment</b>	<b>Typical Noise Level (dBA) 50 ft. from Source</b>
Paver	89
Pile drivers (impact)	101
Pile drivers (sonic)	96
Pneumatic Tool	85
Pump	76
Rail Saw	90
Rock Drill	98
Roller	74
Saw	76
Scarifier	83
Scraper	89
Shovel	82
Spike Driver	77
Tie Cutter	84
Tie Handler	80
Tie Inserter	85
Truck	88

Source: FTA, *Transit Noise and Vibration Impact Assessment*, FTA-VA-90-1003-06, May 2006. Based on EPA Report (“Noise from Construction Equipment and Operations, Building Equipment and Home Appliances” NTID300.1, December 31, 1971), measured data from railroad construction equipment taken during the Northeast Corridor Improvement Project, and other measured data.

Construction for the Proposed Action will be located in two general areas on the New Haven Rail Yard (NHRY) site:

- Southwest of Church Street extension
- Northeast of Church Street Extension

**Southwest of Church Street Extension**

Construction activities taking place southwest of Church Street Extension will involve the laying down of new storage tracks, improvements to existing storage tracks, construction of the heavy paint/repair shop, and improvements to the existing car shop and diesel shop. Construction vehicles and equipment will enter the site from the Long Wharf Avenue and Brewery Street entrances. The Hallock Avenue entrance (which abuts several homes) will not be used for construction.

Work on the storage tracks will involve some excavation, earthmoving, and grading, placement of subsurface utilities, installation of manifold system for dumping of waste, laying down of subsurface ballast, rail, ties, and stone. Construction will also include stone tamping. Some of the equipment used for this work includes dozers, backhoes, dump trucks, loaders, graders, and cranes. Cranes are also used to set-up the framework for the overhead catenary structures. Construction of the heavy paint/repair shop will involve the use of pile drivers. Piles will be used to provide foundation support for the heavy paint/repair shop. After the ground is augured to ensure the absence of utility lines, a pile driver will be used to fix the position of the piles. The use of pile drivers will be minimized, and fewer than 20 piles will be needed southwest of Church Street Extension. The pile driving southwest of the Church Street Extension will be limited in duration, taking between two weeks and one month to complete. Cranes will also be used in the building of the heavy paint/repair shop.

Construction work on the west end storage tracks will take place between 2008 and 2012. Construction of the heavy paint/repair shop and improvements to the existing car shop and diesel shop will also take place between 2008 and 2012. Construction work on the east end rail yard will take place between 2012 and 2015.

Phase I — 2008–2012

The noisiest construction activity between 2008 and 2012 will involve the use of pile drivers for the construction of the heavy paint/repair shop. This activity will take place approximately 650 feet from the nearest noise sensitive receptors (a residential cluster), but it will be limited in its duration (up to one month).

<b>Noisiest Equipment 2008–2012 Southwest of Church St. Ext.</b>	<b>Typical Noise Level (dBA) 50 ft. from Source</b>	<b>Noise Level (dBA) 650 ft. from Source*</b>
Pile drivers (impact)	101	Up to 83

\*Assumes reduction of 6 (dBA) for additional 50 feet from noise source.

The noise level at the noise sensitive receptor (residential cluster) located 650 feet from the noise source (the pile driver) is 83 dBA. This noise level does not exceed daytime

(90 dBA) levels for residential, or daytime (100 dBA) or nighttime (100 dBA) levels for commercial or industrial. Therefore, there is no anticipated impact.

However, this noise level of 83 dBA does exceed the nighttime (80 dBA) levels for residential. Therefore, restrictions will be placed on nighttime construction (relating to pile driving activities) to avoid this impact.

Phase II — 2012–2015

The noisiest and most persistent construction activity between 2012 and 2015 will be the use of cranes and trucks. Construction activity will be located approximately 900 feet from the nearest noise sensitive receptors (a residential cluster).

<b>Noisiest Equipment 2012-2015 Southwest of Church St. Ext.</b>	<b>Typical Noise Level (dBA) 50 ft. from Source</b>	<b>Noise Level (dBA) 900 ft. from Source*</b>
Crane (mobile)	83	Up to 59
Trucks	88	Up to 64
Combined Noise Level**	89	Up to 65

\*Assumes reduction of 6 (dBA) for additional 50 feet from noise source.

\*\*Because noise is measured on a decibel scale, combining two noise levels is not achieved by simple addition. When combining two noise levels whose values differ by 5 decibels, the combined noise level is 1 decibel greater than the highest of the two noise levels.

The combined noise level from cranes and trucks (up to 65 dBA) is well below daytime (90 dBA) or nighttime (80 dBA) levels for residential, or daytime (100 dBA) or nighttime (100 dBA) levels for commercial or industrial. Therefore, there is no anticipated impact.

**Northeast of Church Street Extension**

Construction activities taking place northeast of Church Street Extension will involve construction of the component change-out shop, service and inspection shop, independent wheel true shop, and improvements to the EMU shop. Construction vehicles will only enter the site from the Long Wharf and Brewery Street entrances minimizing the noise impacts to the residential buildings.

Construction on the northeast side of Church Street Extension will be similar in nature throughout the duration of construction (all three phases, from 2008–2020). Work on the component change-out shop, service and inspection shop, and independent wheel true shop will involve some excavation, earth moving, and building construction. Some of the equipment used for this work includes dozers, backhoes, dump trucks, loaders, graders,

and cranes. A large number of piles will need to be driven into place. The piles are used in the foundation support for the heavy paint/repair shop.

The noisiest construction activities taking place northeast of Church Street Extension, and within approximately 780 feet of noise sensitive receptors, involves the use of pile drivers. There are intervening structures such as Union Station and other buildings between the construction activities and the noise sensitive receptors that will provide additional reduction in noise levels. Noise sensitive receptors within 1,000 feet (obstructed) of the construction activity include: Robert T. Wolfe apartment building, Church Street South Apartments, Hill Seventh Day Adventist Church, and residences south of the Church Street South and Union Avenue intersection.

<b>Noisiest Equipment Northeast of Church St. Ext.</b>	<b>Typical Noise Level (dBA) 50 ft. from Source</b>	<b>Noise Level (dBA) 780 ft. from Source*</b>
Pile drivers (impact)	101	Up to 83

\*Assumes reduction of 6 (dBA) for additional 50 feet from noise source. The estimated noise level 780 feet from the source also does not take into account the dampening effect that will result from the intervening structures so in reality the noise level at the noise sensitive receptors will be lower than the reported value in this table.

The noise level at the noise sensitive receptors located about 780 feet from the noise source (pile driver) is 83 dBA. This noise level does not exceed daytime (90 dBA) levels for residential, or daytime (100 dBA) or nighttime (100 dBA) levels for commercial or industrial. Therefore, there is no anticipated impact.

However, the noise level of 83 dBA does exceed the nighttime (80 dBA) levels for residential. Therefore, restrictions will be placed on nighttime construction activities to avoid this impact.

**Public Comment**

There will be an opportunity for public comment at the public hearing for the EA/EIE. Information will be provided at the public hearing on the construction process, such as the kinds of equipment that will be used, the expected noise levels, and duration of construction. Communication with local residents and businesses and the City of New Haven will help coordinate construction activities and avoid, minimize, and mitigate for noise impacts.

**MITIGATION**

While construction noise is exempt under Section 22a-69-1.8(g) of the RCSA, construction documents will require the contractor to limit the duration and intensity of noise generated by construction. To mitigate the potential impacts during construction:

- Noise abatement measures in accordance with ConnDOT Form 816 will be included in construction specifications. Such measures include appropriate mufflers on all construction vehicles and restrictions on hours of operation. Nighttime activities will be avoided.
- Truck traffic will be routed onto streets with the fewest homes. Construction vehicles and equipment will enter the site from Long Wharf Avenue and Brewery Street entrance, which has good access to I-95, I-91, and Route 34. The Hallock Avenue entrance (adjacent to several residences) will be restricted from use for construction. And, it is not anticipated that Union Avenue will need to be used for construction purposes.
- There are some existing obstructions, such as buildings, already buffering noise. However, there may be an additional need for the erection of temporary noise barriers around the work site where such barriers are deemed effective at buffering adjacent land uses from construction noise.
- Ensure muffler devices on construction equipment are installed and maintained properly.
- The project team will conduct ongoing coordination with the City of New Haven to employ other measures that may be effective to minimize noise disturbance to nearby residents.
- Overall, the Proposed Action is envisioned to be in compliance with the Connecticut Noise Regulations. The City of New Haven Noise Ordinance is contained within Section 18-19 of the City's Zoning Regulations. While State of Connecticut projects are not required to comply with local zoning, the operation of the Proposed Action will be conducted in a manner that meets the objectives of the City's noise regulations to the extent feasible.

## **REFERENCE**

U.S. Department of Transportation, Federal Transit Administration, May 2006. *Transit Noise and Vibration Impact Assessment*, (FTA-VA-90-103-06).

**APPENDIX**

**FTANOISE SPREADSHEETS  
AND SCREENING DISTANCE MAPS**



**Federal Transit Administration**  
**General Transit Noise Assessment**  
**Case: NHRY EA/EIE - Receptor #1 (2006)**

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<b>RESULTS</b>			
<b>Noise Source</b>	<b>Ldn (dB)</b>	<b>Leq - daytime (dB)</b>	<b>Leq - nighttime (dB)</b>
All Sources	59	55	52
Source 1	58	54	51
Source 2	42	39	35
Source 3	53	46	47

*Enter noise receiver land use category below.*

<b>LAND USE CATEGORY</b>	
Noise receiver land use category (1, 2 or 3)	2

*Enter data for each noise source below - see reference list for source numbers.*

<b>NOISE SOURCE PARAMETERS</b>						
<b>Parameter</b>	<b>Source 1 - Union Ave.</b>		<b>Source 2 - Church St. So.</b>		<b>Source 3 - NHRY</b>	
Source Num.	Automobiles	9	Automobiles	9	Rail Yard or Shop	12
Dist. to receiver	distance (ft)	84	distance (ft)	919	distance (ft)	980
Daytime Hours (7 AM - 10 PM)	speed (mph)	25	speed (mph)	25	trains/hour	7
	vehicles/hour	453	vehicles/hour	442		
Nighttime Hours (10 PM - 7 AM)	speed (mph)	25	speed (mph)	25	trains/hour	9
	vehicles/hour	188	vehicles/hour	184		
Jointed Track?		Y		Y		Y
Embedded Track?		N		N		N
Aerial Structure?		N		N		N
Barrier Present?	Y/N	N	Y/N	N	Y/N	N
Intervening Rows of Buildings	number	0	number	0	number	0

**Federal Transit Administration**  
**General Transit Noise Assessment**  
**Case: NHRY EA/EIE - Receptor #2 (2006)**

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<b>RESULTS</b>			
<b>Noise Source</b>	<b>Ldn (dB)</b>	<b>Leq - daytime (dB)</b>	<b>Leq - nighttime (dB)</b>
All Sources	59	55	52
Source 1	57	53	50
Source 2	49	46	42
Source 3	54	47	48

*Enter noise receiver land use category below.*

<b>LAND USE CATEGORY</b>	
Noise receiver land use category (1, 2 or 3)	2

*Enter data for each noise source below - see reference list for source numbers.*

<b>NOISE SOURCE PARAMETERS</b>					
<b>Parameter</b>	<b>Source 1 - Union Ave.</b>		<b>Source 2 - Church St. So.</b>		<b>Source 3 - NHRY</b>
Source Num.	Automobiles	9	Automobiles	9	Rail Yard or Shop 12
Dist. to receiver	distance (ft)	98	distance (ft)	315	distance (ft) 893
Daytime Hours (7 AM - 10 PM)	speed (mph)	25	speed (mph)	25	trains/hour 7
	vehicles/hour	453	vehicles/hour	442	
Nighttime Hours (10 PM - 7 AM)	speed (mph)	25	speed (mph)	25	trains/hour 9
	vehicles/hour	188	vehicles/hour	184	
Jointed Track?		Y		Y	Y
Embedded Track?		N		N	N
Aerial Structure?		N		N	N
Barrier Present?	Y/N	N	Y/N	N	Y/N N
Intervening Rows of Buildings	number	0	number	0	number 0

**Federal Transit Administration**  
**General Transit Noise Assessment**  
**Case: NHRY EA/EIE - Receptor #3 (2006)**

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<b>RESULTS</b>			
<b>Noise Source</b>	<b>Leq - 1-hr (dB)</b>		
All Sources	53		
Source 1	40		
Source 2	51		
Source 3	48		

*Enter noise receiver land use category below.*

<b>LAND USE CATEGORY</b>	
Noise receiver land use category (1, 2 or 3)	3

*Enter data for each noise source below - see reference list for source numbers.*

<b>NOISE SOURCE PARAMETERS</b>						
<b>Parameter</b>	<b>Source 1 - Union Ave.</b>		<b>Source 2 - Church St. So.</b>		<b>Source 3 - NHRY</b>	
Source Num.	Automobiles	9	Automobiles	9	Rail Yard or Shop	12
Dist. to receiver	distance (ft)	750	distance (ft)	142	distance (ft)	783
Noisiest Hour of Activity During Sensitive Hours	speed (mph)	25	speed (mph)	25	trains/hour	7
	vehicles/hour	453	vehicles/hour	442		
		25		25		9
		188		184		
Jointed Track?		Y		Y		Y
Embedded Track?		N		N		N
Aerial Structure?		N		N		N
Barrier Present?	Y/N	N	Y/N	N	Y/N	N
Intervening Rows of Buildings	number	0	number	0	number	0

**Federal Transit Administration**  
**General Transit Noise Assessment**  
**Case: NHRY EA/EIE - Receptor #4 (2006)**

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<b>RESULTS</b>			
<b>Noise Source</b>	<b>Ldn (dB)</b>	<b>Leq - daytime (dB)</b>	<b>Leq - nighttime (dB)</b>
All Sources	52	54	17
Source 1	43	45	-4
Source 2	51	53	3
Source 3	45	47	17

*Enter noise receiver land use category below.*

<b>LAND USE CATEGORY</b>	
Noise receiver land use category (1, 2 or 3)	2

*Enter data for each noise source below - see reference list for source numbers.*

<b>NOISE SOURCE PARAMETERS</b>					
<b>Parameter</b>	<b>Source 1 - Union Ave.</b>		<b>Source 2 - Church St. So.</b>		<b>Source 3 - NHRY</b>
Source Num.	Automobiles	9	Automobiles	9	Rail Yard or Shop
Dist. to receiver	distance (ft)	525	distance (ft)	166	distance (ft)
Daytime Hours (7 AM - 10 PM)	speed (mph)	25	speed (mph)	25	trains/hour
	vehicles/hour	850	vehicles/hour	830	
Nighttime Hours (10 PM - 7 AM)	speed (mph)		speed (mph)		trains/hour
	vehicles/hour		vehicles/hour		
Jointed Track?		Y		Y	Y
Embedded Track?		N		N	N
Aerial Structure?		N		N	N
Barrier Present?	Y/N	N	Y/N	N	Y/N
Intervening Rows of Buildings	number	0	number	0	number
					0

**Federal Transit Administration**  
**General Transit Noise Assessment**  
**Case: NHRY EA/EIE - Receptor #5 (2006)**

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<b>RESULTS</b>			
<b>Noise Source</b>	<b>Ldn (dB)</b>	<b>Leq - daytime (dB)</b>	<b>Leq - nighttime (dB)</b>
All Sources	64	66	42
Source 1	42	38	35
Source 2	64	66	42
Source 3	44	46	18

*Enter noise receiver land use category below.*

<b>LAND USE CATEGORY</b>	
Noise receiver land use category (1, 2 or 3)	2

*Enter data for each noise source below - see reference list for source numbers.*

<b>NOISE SOURCE PARAMETERS</b>						
<b>Parameter</b>	<b>Source 1 - Union Ave.</b>		<b>Source 2 - Loop Tracks</b>		<b>Source 3 - NHRY</b>	
Source Num.	Automobiles	9	Layover Tracks	13	Rail Yard or Shop	12
Dist. to receiver	distance (ft)	961	distance (ft)	285	distance (ft)	921
Daytime Hours (7 AM - 10 PM)	speed (mph)	25	trains/hour	3	trains/hour	7
	vehicles/hour	453				
Nighttime Hours (10 PM - 7 AM)	speed (mph)	25	trains/hour		trains/hour	
	vehicles/hour	188				
Jointed Track?		Y		Y		Y
Embedded Track?		N		N		N
Aerial Structure?		N		N		N
Barrier Present?	Y/N	N	Y/N	N	Y/N	N
Intervening Rows of Buildings	number	0	number	0	number	0

**Federal Transit Administration**  
**General Transit Noise Assessment**  
**Case: NHRY EA/EIE - Receptor #1 (2030)**

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<b>RESULTS</b>			
<b>Noise Source</b>	<b>Ldn (dB)</b>	<b>Leq - daytime (dB)</b>	<b>Leq - nighttime (dB)</b>
All Sources	53	46	47
Source 1	53	46	47
Source 2	0	0	0
Source 3	0	0	0

*Enter noise receiver land use category below.*

<b>LAND USE CATEGORY</b>	
Noise receiver land use category (1, 2 or 3)	2

*Enter data for each noise source below - see reference list for source numbers.*

<b>NOISE SOURCE PARAMETERS</b>			
<b>Parameter</b>	<b>Source 1 - NHRY</b>	<b>Source 2</b>	<b>Source 3</b>
Source Num.	Rail Yard or Shop	12	
Dist. to receiver	distance (ft)	980	
Daytime Hours (7 AM - 10 PM)	trains/hour	7	
Nighttime Hours (10 PM - 7 AM)	trains/hour	9	
Jointed Track?		Y	
Embedded Track?		Y	
Aerial Structure?		N	
Barrier Present?	Y/N	N	
Intervening Rows of Buildings	number	0	

**Federal Transit Administration  
 General Transit Noise Assessment  
 Case: NHRY EA - Receptor #2 (2030)**

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<b>RESULTS</b>			
<b>Noise Source</b>	<b>Ldn (dB)</b>	<b>Leq - daytime (dB)</b>	<b>Leq - nighttime (dB)</b>
All Sources	54	47	48
Source 1	54	47	48
Source 2	0	0	0
Source 3	0	0	0

*Enter noise receiver land use category below.*

<b>LAND USE CATEGORY</b>	
Noise receiver land use category (1, 2 or 3)	2

*Enter data for each noise source below - see reference list for source numbers.*

<b>NOISE SOURCE PARAMETERS</b>			
<b>Parameter</b>	<b>Source 1 - NHRY</b>	<b>Source 2</b>	<b>Source 3</b>
Source Num.	Rail Yard or Shop	12	
Dist. to receiver	distance (ft)	885	
Daytime Hours (7 AM - 10 PM)	trains/hour	7	
Nighttime Hours (10 PM - 7 AM)	trains/hour	9	
Jointed Track?		Y	
Embedded Track?		Y	
Aerial Structure?		N	
Barrier Present?	Y/N	N	
Intervening Rows of Buildings	number	0	

**Federal Transit Administration  
 General Transit Noise Assessment  
 Case: NHRY EA - Receptor #3 (2030)**

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<b>RESULTS</b>			
<b>Noise Source</b>	<b>Leq - 1-hr (dB)</b>		
All Sources	48		
Source 1	48		
Source 2	0		
Source 3	0		

*Enter noise receiver land use category below.*

<b>LAND USE CATEGORY</b>	
Noise receiver land use category (1, 2 or 3)	3

*Enter data for each noise source below - see reference list for source numbers.*

<b>NOISE SOURCE PARAMETERS</b>			
<b>Parameter</b>	<b>Source 1 - NHRY</b>	<b>Source 2</b>	<b>Source 3</b>
Source Num.	Rail Yard or Shop	12	
Dist. to receiver	distance (ft)	783	
Noisiest Hour of Activity During Sensitive Hours	trains/hour	7	
		9	
Jointed Track?		Y	
Embedded Track?		Y	
Aerial Structure?		N	
Barrier Present?	Y/N	N	
Intervening Rows of Buildings	number	0	

**Federal Transit Administration  
 General Transit Noise Assessment  
 Case: NHRY EA - Receptor #4 (2030)**

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<b>RESULTS</b>			
<b>Noise Source</b>	<b>Ldn (dB)</b>	<b>Leq - daytime (dB)</b>	<b>Leq - nighttime (dB)</b>
All Sources	53	45	47
Source 1	53	45	47
Source 2	0	0	0
Source 3	0	0	0

*Enter noise receiver land use category below.*

<b>LAND USE CATEGORY</b>	
Noise receiver land use category (1, 2 or 3)	2

*Enter data for each noise source below - see reference list for source numbers.*

<b>NOISE SOURCE PARAMETERS</b>			
<b>Parameter</b>	<b>Source 1 - NHRY</b>	<b>Source 2</b>	<b>Source 3</b>
Source Num.	Rail Yard or Shop 12		
Dist. to receiver	distance (ft) 988		
Daytime Hours (7 AM - 10 PM)	trains/hour 7		
Nighttime Hours (10 PM - 7 AM)	trains/hour 9		
Jointed Track?	Y		
Embedded Track?	Y		
Aerial Structure?	N		
Barrier Present?	Y/N N		
Intervening Rows of Buildings	number 0		

**Federal Transit Administration**  
**General Transit Noise Assessment**  
**Case: NHRY EA - Receptor #5 (2030)**

**Copyright 1997, HMMH Inc.**  
 Sponsored by FTA contract #DTUM60-92-C-41008  
 Government users have unrestricted rights to this program

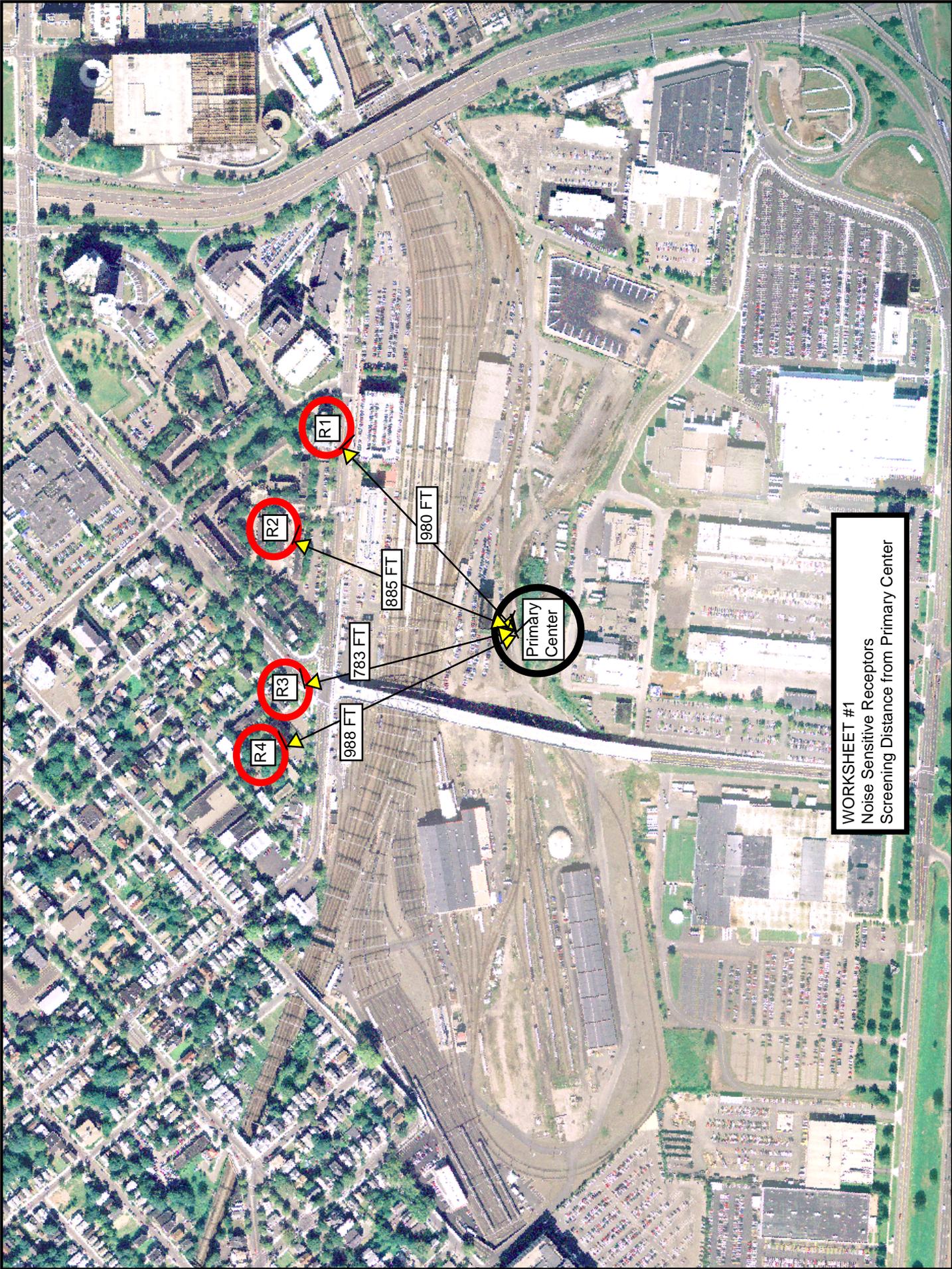
<b>RESULTS</b>			
<b>Noise Source</b>	<b>Ldn (dB)</b>	<b>Leq - daytime (dB)</b>	<b>Leq - nighttime (dB)</b>
All Sources	54	56	29
Source 1	54	56	29
Source 2	0	0	0
Source 3	0	0	0

*Enter noise receiver land use category below.*

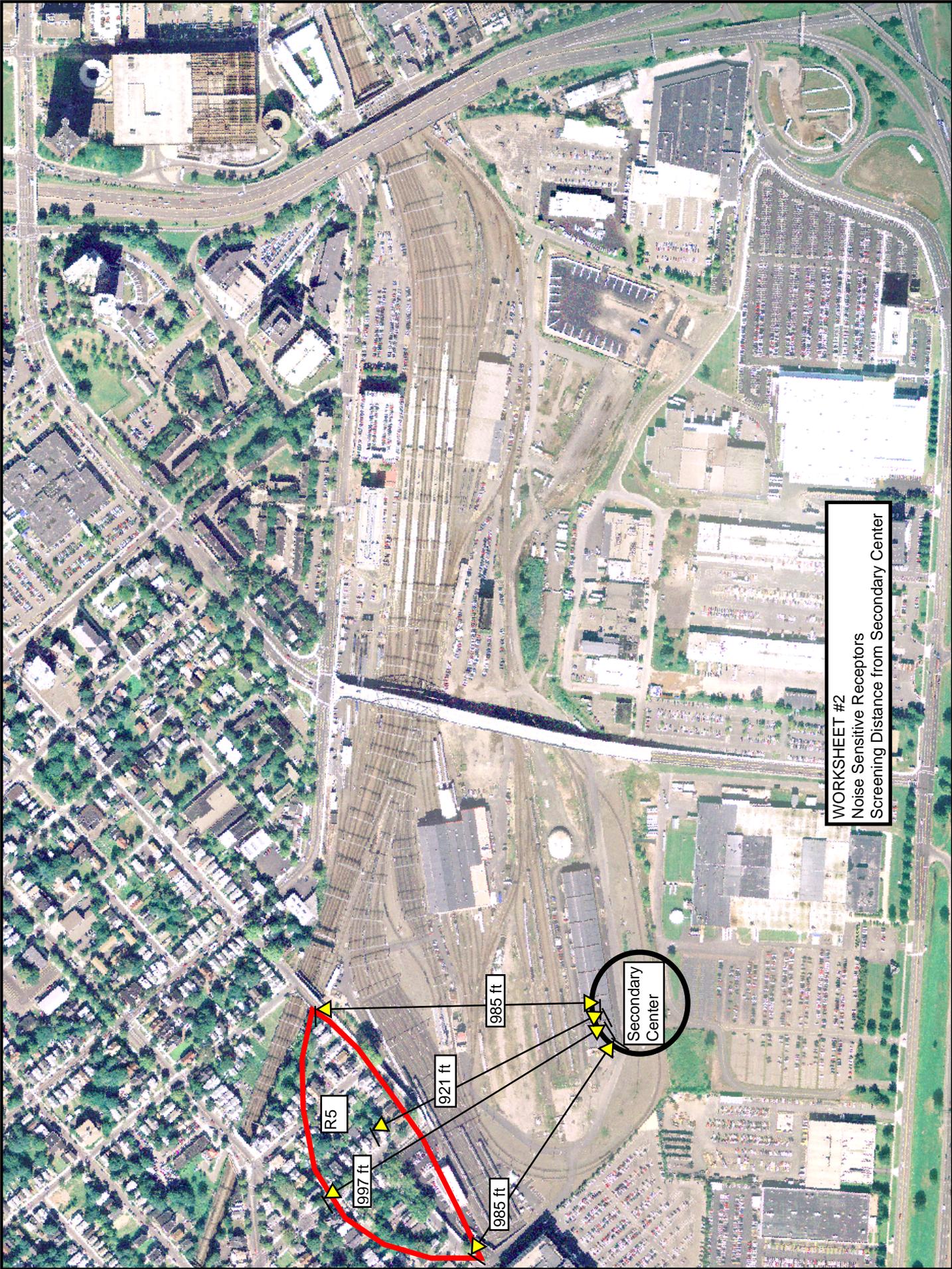
<b>LAND USE CATEGORY</b>	
Noise receiver land use category (1, 2 or 3)	2

*Enter data for each noise source below - see reference list for source numbers.*

<b>NOISE SOURCE PARAMETERS</b>			
<b>Parameter</b>	<b>Source 1 - Storage Tracks</b>	<b>Source 2</b>	<b>Source 3</b>
Source Num.	Layover Tracks 13		
Dist. to receiver	distance (ft) 921		
Daytime Hours (7 AM - 10 PM)	trains/hour 5		
Nighttime Hours (10 PM - 7 AM)	trains/hour		
Jointed Track?	Y		
Embedded Track?	Y		
Aerial Structure?	N		
Barrier Present?	Y/N N		
Intervening Rows of Buildings	number 0		



WORKSHEET #1  
Noise Sensitive Receptors  
Screening Distance from Primary Center



WORKSHEET #2  
Noise Sensitive Receptors  
Screening Distance from Secondary Center

Secondary Center

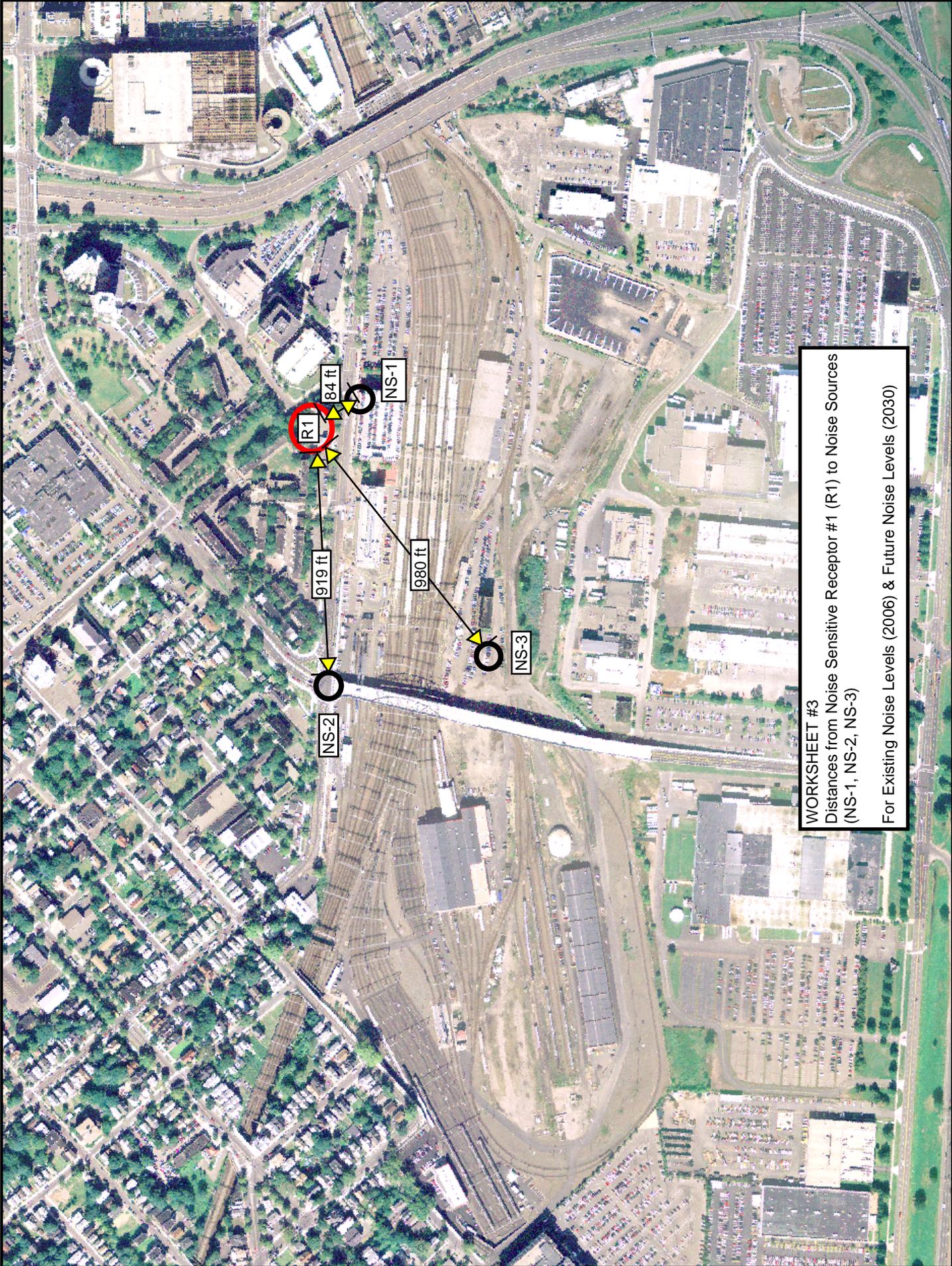
R5

997 ft

921 ft

985 ft

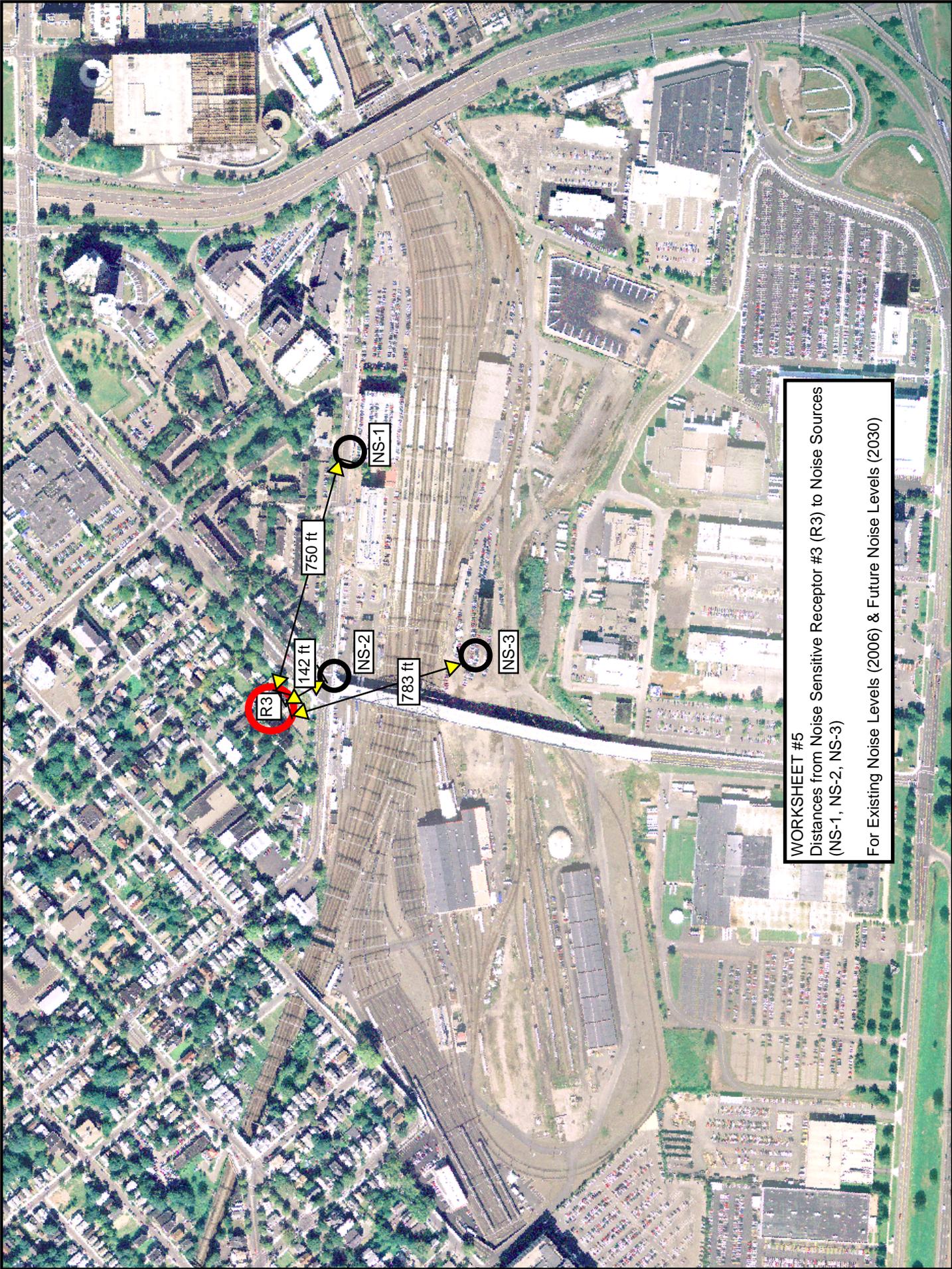
985 ft



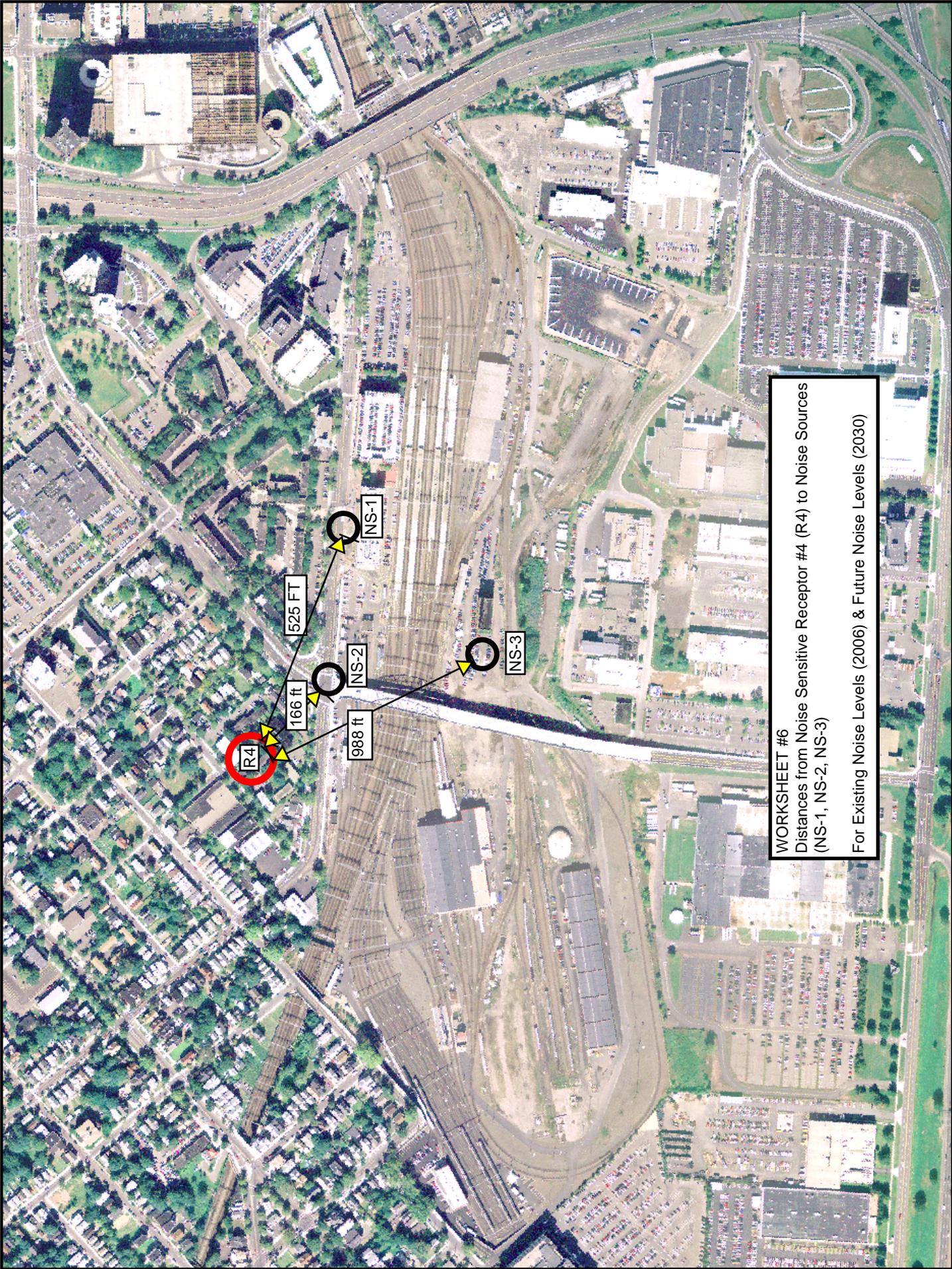
**WORKSHEET #3**  
Distances from Noise Sensitive Receptor #1 (R1) to Noise Sources  
(NS-1, NS-2, NS-3)  
For Existing Noise Levels (2006) & Future Noise Levels (2030)



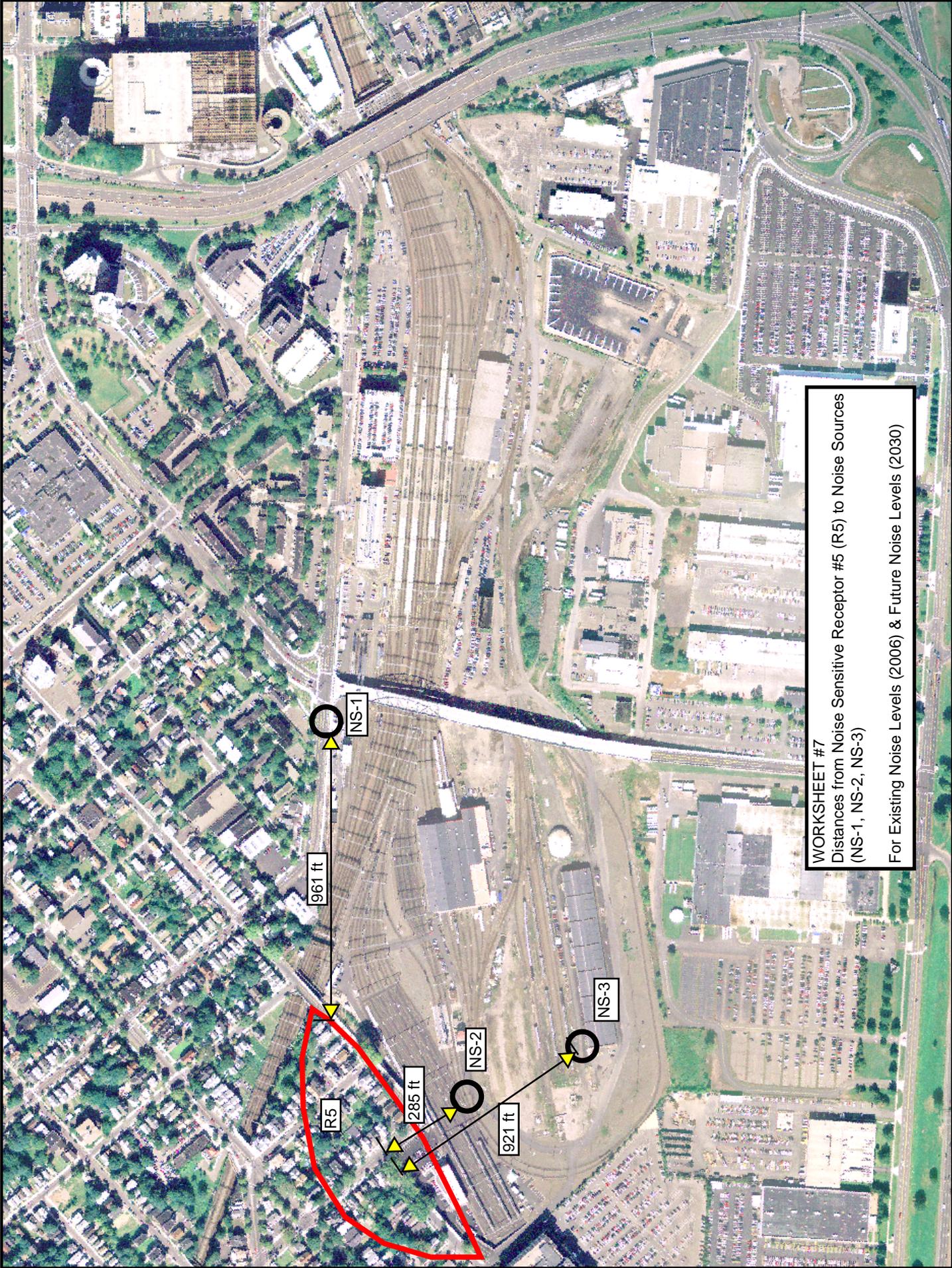
**WORKSHEET #4**  
Distances from Noise Sensitive Receptor #2 (R2) to Noise Sources  
(NS-1, NS-2, NS-3)  
For Existing Noise Levels (2006) & Future Noise Levels (2030)



**WORKSHEET #5**  
Distances from Noise Sensitive Receptor #3 (R3) to Noise Sources (NS-1, NS-2, NS-3)  
For Existing Noise Levels (2006) & Future Noise Levels (2030)



**WORKSHEET #6**  
Distances from Noise Sensitive Receptor #4 (R4) to Noise Sources  
(NS-1, NS-2, NS-3)  
For Existing Noise Levels (2006) & Future Noise Levels (2030)



**WORKSHEET #7**  
Distances from Noise Sensitive Receptor #5 (R5) to Noise Sources  
(NS-1, NS-2, NS-3)  
For Existing Noise Levels (2006) & Future Noise Levels (2030)



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**APPENDIX C: CIRCULATION LIST**

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## CIRCULATION LIST

The following agencies/persons received a copy of the Environmental Assessment/Draft Environmental Impact Evaluation for the New Haven Rail Maintenance Facility:

### U.S. Representatives and Senators

Hon. Joseph I. Lieberman U.S. Senator 316 Senate Hart Office Building Washington, D.C. 20510	Hon. Christopher J. Dodd U.S. Senator 225 Senate Russell Office Building Washington, D.C. 20510
Hon. Rosa L. DeLauro U.S. Representative 3 <sup>rd</sup> District 2262 Rayburn House Office Building Washington, D.C. 20515	Hon. James Himes U.S. Representative 4 <sup>th</sup> District 1502 Longworth House Office Building Washington, D.C. 20515

### Chief State and City Elected Officials

Hon. M. Jodi Rell Governor, State of Connecticut State Capitol Hartford, CT 06106	Mayor John DeStefano, Jr. City of New Haven 165 Church Street New Haven, CT 06511
--	--

### Other City Officials/Representatives

Hon. Gerald Antunes Alderman, Ward 12 195 Weybosset Street New Haven, CT 06513	Hon. Charles Blango Alderman, Ward 20 197 Newhall Street New Haven, CT 06511	Hon. Migdalia Castro Alderman, Ward 16 342 Popular Street New Haven, CT 06513
Hon. Gina Calder Alderman, Ward 2 182 Dwight Street #1F New Haven, CT 06511	Hon. Dolores Colon Alderman, Ward 6 34 Salem Street New Haven, CT 06519	Hon. Arlene DePino Alderman, Ward 18 1354 Dean Street New Haven, CT 06512
Hon. Michelle Edmonds-Sepulveda Alderman, Ward 30 27 Rock Creek Road New Haven, CT 06515	Hon. Alfreda Edwards Alderman, Ward 19 122 Sheffield Avenue New Haven, CT 06511	Hon. Carl Goldfield Alderman, Ward 29 25 Roydon Rd. New Haven, CT 06511

**Other City Officials/Representatives (continued)**

Hon. Mordechai Sandman Alderman Ward 28 195 Colony Road New Haven, CT 06511	Hon. Yusuf Shah Alderman Ward 23 59 Gilbert Avenue New Haven, CT 06511	Hon. Rachel Plattus Alderman Ward 1 P.O.Box 20500 New Haven, CT 06520
Hon. Ina Silverman Alderman Ward 25 25 Woodside Terrace New Haven, CT 06515	Hon. Michael Smart Alderman Ward 8 1 Lyon Street, 2nd Floor New Haven, CT 06511	Hon. Erin Sturgis-Pascale Alderman Ward 14 332 Front Street New Haven, CT 06513
Hon. Juan Candelaria State Representative 95th District Legislative Office Building Hartford, CT 06106	Hon. Vincent Candelora State Representative 86th District Legislative Office Building Hartford, CT 06106	Hon. Stephen Dargen State Representative 115th District Legislative Office Building Hartford, CT 06106
Hon. Paul Davis State Representative 117th District Legislative Office Building Hartford, CT 06106	Hon. Toni Walker State Representative 93rd District Legislative Office Building Hartford, CT 06106	Hon. Patricia Dillon State Representative 92nd District Legislative Office Building Hartford, CT 06106
Hon. Cameron Staples State Representative 96th District Legislative Office Building Hartford, CT 06106	Hon. Gary Holder-Winfield State Representative 94th District Legislative Office Building Hartford, CT 06106	Hon. Louis Esposito State Representative 116th District Legislative Office Building Hartford, CT 06106
Hon. Robert Megna State Representative 97th District Legislative Office Building Hartford, CT 06106	Hon. Steve Fontana State Representative 87th District Legislative Office Building Hartford, CT 06106	Hon. Toni Harp State Senator 10th District Legislative Office Building Hartford, CT 06106
Hon. Michael Lawlor State Representative 99th District Legislative Office Building Hartford, CT 06106	Hon. Gayle Slossberg State Senator 14th District Legislative Office Building Hartford, CT 06106	Hon. Martin Looney State Senator 11th District Legislative Office Building Hartford, CT 06106

Mr. Michael Piscitelli City of New Haven –Transp., Traffic & Parking 200 Orange St. New Haven, CT 06510	Mr. Richard Miller City Engineer City of New Haven Engineering 270 Knollwood Dr. New Haven, CT 06515	Ms. Karyn Gilvarg Director City of New Haven Plan 165 Church St. New Haven, CT 06510
Mr. Tony Bialecki New Haven Office of Business Development 970 Chapel Street New Haven, CT 06510	Chief James Lewis New Haven Police Department 165 Church Street New Haven, CT 06510	Mr. John Russo, Chairman Port Authority Commission 95 Roger Rd. New Haven, CT 06515
Mr. Robert Levine City of New Haven Parks and Recreation 720 Edgewood Avenue New Haven, CT 06515	Ms. Judi Sheffele City of New Haven Real Estate Services 209 Orange Street New Haven, CT 06510	Dr. Reginald Mayo City of New Haven Department of Education 54 Meadow Street New Haven, CT 06519

### **State Departments/Officials**

Ms. Gina McCarthy Commissioner CT DEP 79 Elm Street Hartford, CT 06106	Ms. Joan McDonald Commissioner Connecticut DECD 505 Hudson Street Hartford, CT 06106	Mr. Kendall Wiggin State Librarian Connecticut State Library 231 Capitol Avenue Hartford, CT 06106
Mr. David Fox Senior Environmental Analyst Connecticut DEP 79 Elm Street Hartford, CT 06106	Mr. Raymond Jordan State Coordinator CT Department of Housing and Urban Development One Corporate Center, 19th Fl. Hartford, CT 06103	

**State Departments/Officials (continued)**

<p>Hon. J. Robert Glavin, M.D., M.P.H. Commissioner Department of Public Health 410 Capitol Avenue, MS#13COM Hartford, CT 06106</p>	<p>Ms. Karen Senich Historic Preservation Office CT Commission on Culture &amp; Tourism Historic Preservation &amp; Museum Division 59 South Prospect Street Hartford, CT 06106</p>	<p>Hon. Robert Genuario Secretary Office of Policy and Management 450 Capitol Avenue Hartford, CT 06106</p>
<p>Ms. Lori Mathieu Water Supply Section CT Dept of Public Health 410 Capital Ave. Hartford, CT 06134-0308</p>	<p>Hon. Raeanne V. Curtis Commissioner Connecticut Department of Public Works 165 Capitol Avenue Hartford, CT 06106</p>	<p>Mr. Karl J. Wagener Executive Director Council on Environmental Quality 79 Elm Street Hartford, CT 06106</p>

**U.S. Departments/Officials**

<p>Andrew Raddant Regional Environmental Officer U.S. Department of the Interior Office of Environmental Policy and Compliance Regional Environmental Office 408 Atlantic Avenue, Room 142 Boston, MA 02210-3334</p>	<p>Mr. Tom Chapman Supervisor U.S. Department of the Interior Fish and Wildlife Service New England Field Offices 70 Commercial Street Suite 300 Concord, NH 03301-5087</p>
<p>Ms. Christine Godfrey Chief Regulatory Branch U.S. Army Corps of Engineers New England Division 696 Virginia Road Concord, MA 01742-2751</p>	<p>Mr. Ira Leighton Acting Regional Administrator U.S. EPA Region 1 One Congress Street, Suite 1100 Boston, MA 02114-2023</p>

**Others**

<p>Ms. Judy Gott, Director South Central Regional Council of Governments 127 Washington Avenue, 4th Floor West North Haven, CT 06473</p>	<p>Mr. Tom Chaplik South Central Regional Water Authority 90 Sargent Drive New Haven, CT 06511-5966</p>
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**APPENDIX D: WETLANDS REPORT**

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# Connecticut Ecosystems LLC

- Wetland Delineation
- Wetland & Aquatic Evaluation
- Mitigation
- Natural Resource Inventory
- Permit Assistance
- Expert Testimony



## ON-SITE SOIL INVESTIGATION REPORT

### Project Name & Location

New Haven Rail Maintenance Facility

New Haven, CT

### CE Job No.: 06-61

Field Investigation Date(s): 9/6/06

Field Investigation Method(s):

Spade & Auger

Backhoe & Test Pits

### Report Prepared For:

Fitzgerald and Halliday, Inc.

Attn.: Ms. Marianne Latimer

72 Cedar Street

Hartford, CT 06106

### Field Conditions:

Weather: partly cloudy, 80F

Recent Precipitation: average

Soil Moisture: average

Snow Depth: ---

Frost Depth: ---

### Purpose of Investigation:

Wetland Delineation/Flagging

Sketch Wetland Boundaries on Base Map (No Flagging)

High Intensity Soil Mapping by Soil Scientist

Medium Intensity Soil Mapping from SCS Soil Survey Maps

### Base Map:

- Type: PDF Map

Wetland Boundary Marker Series: CE 1-1/18 2-1/23

Intermittent Watercourse Marker Series: ---

### Wetland Notes:

- Type(s): marsh
- Hydroperiod(s): temporarily flooded
- Soil Parent Material(s): glacial till
- Drainage Class(es): poorly
- Slope: gentle

38 Westland Avenue • West Hartford, CT 06107

Phone (860) 561-8598 • Fax (860) 561-0223 • email ecosys@comcast.net

**CONNECTICUT ECOSYSTEMS LLC  
ON-SITE SOIL INVESTIGATION REPORT (CONTINUED)**

**Project Name & Location: New Haven Rail Maintenance Facility, New Haven, CT**  
**Project #: 04-61**

**SOIL MAP UNITS**

Soil symbols used below and on the accompanying Wetland Sketch Map correspond to those in the National Cooperative Soil Survey.

**WETLAND SOIL SERIES**

**Aquents (Disturbed Wetland Soils) (Aq)**

This soil map unit consists of poorly drained and very poorly drained, disturbed land areas. They are most often found on landscapes that were subject to prior filling and/or excavation activities. In general this soil map unit occurs where two or more feet of the original soil surface has been filled over or excavated. Aquents are characterized by a seasonal to prolonged high ground water table and either support or are capable of supporting wetland vegetation.

Aquents are recently formed soils that have an aquic moisture regime. An aquic moisture regime is associated with a reducing soil environment that is virtually free of dissolved oxygen because the soil is saturated by groundwater or by water of the capillary fringe. The key feature is the presence of a ground water table at or very near to the soil surface for a period of fourteen days or longer during the growing season.

The Aquents soil mapping unit is a miscellaneous unit that includes a large variety of soil materials and landscape features. Common locations of Aquents include former gravel pits, urban areas abutting marshland and broad ditches along highways.

Aquents are poorly and very poorly drained. Soil saturation may vary from periodic saturation during the growing season in poorly drained areas, to extended saturation for long periods throughout the year along with periodic ponding in very poorly drained areas. Due to the wide variation of soil materials included in this soil map unit predictions of water table elevations and soil permeabilities require on-site investigations and evaluations.

**UPLAND (NON-WETLAND) SOIL SERIES**

**Urban Land (307)**

The Urban land soil mapping unit consists mainly of areas that are covered by paved roads, parking lots, buildings and other structures. The areas are mostly in densely populated regions of the State. They range in size mostly from 5 to several hundred acres. Most of the original soils underlying Urban land have been altered by excavation or have been covered with fill material. Slopes range from 0 to 25 percent but are mostly 0-8 percent. Included with this mapping unit are small, intermingled areas of Udorthents.

**CONNECTICUT ECOSYSTEMS LLC**  
**ON-SITE SOIL INVESTIGATION REPORT (CONTINUED)**

**Project Name & Location: New Haven Rail Maintenance Facility, New Haven, CT**  
**Project #: 04-61**

The wetlands were field delineated in accordance with the standards of the National Cooperative Soil Survey and the definition of wetlands as found in the Connecticut General Statutes, Chapter 440, Section 22A-38. The investigation was conducted and reviewed by a Registered Soil Scientist.

Respectfully submitted,

Connecticut Ecosystems LLC



Edward M. Pawlak  
Registered Soil Scientist  
Certified Professional Wetland Scientist

File c:\soils2006\06-61.doc







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## **APPENDIX E: TRAFFIC ANALYSIS**

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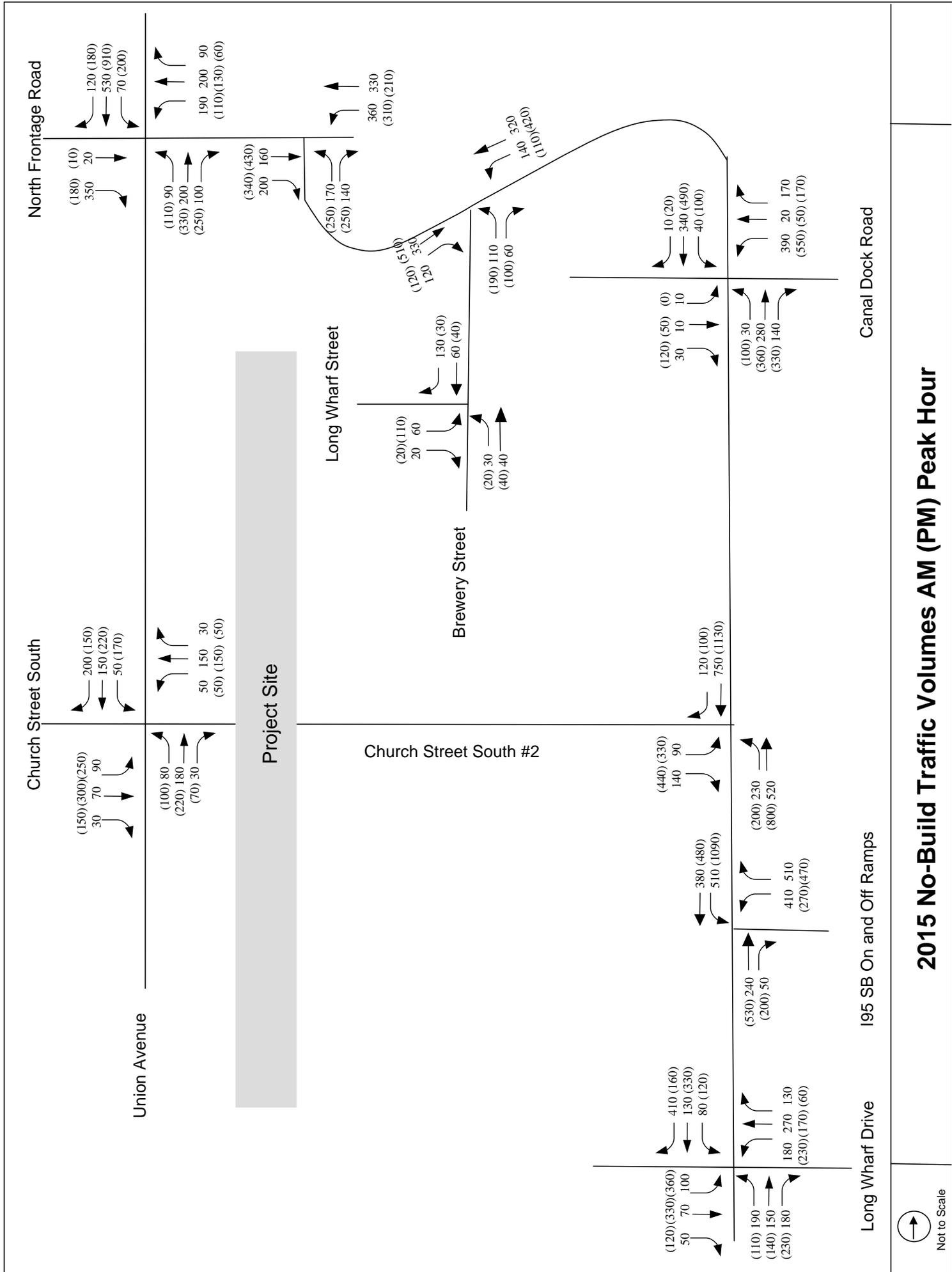
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## TRAFFIC VOLUMES

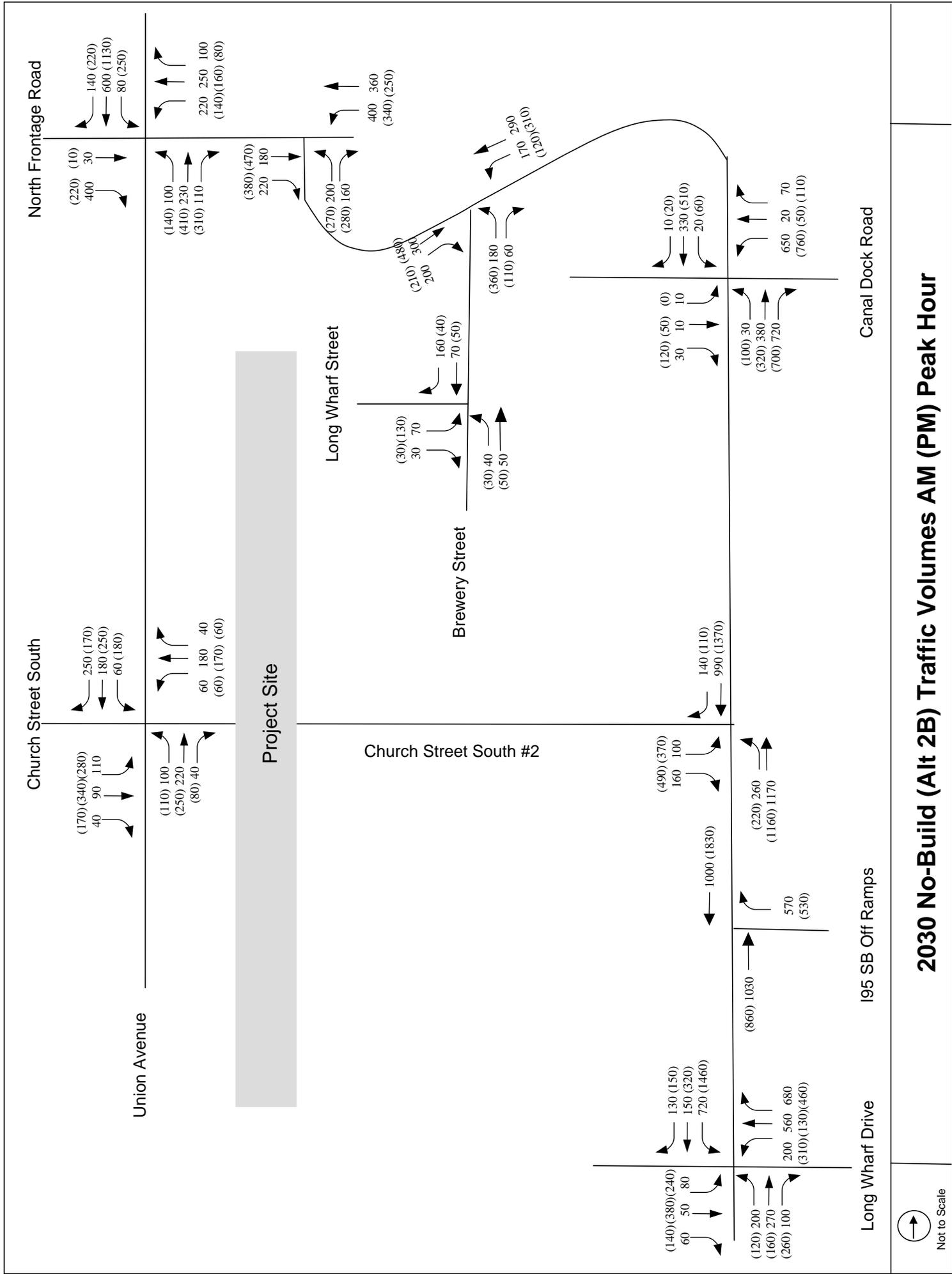
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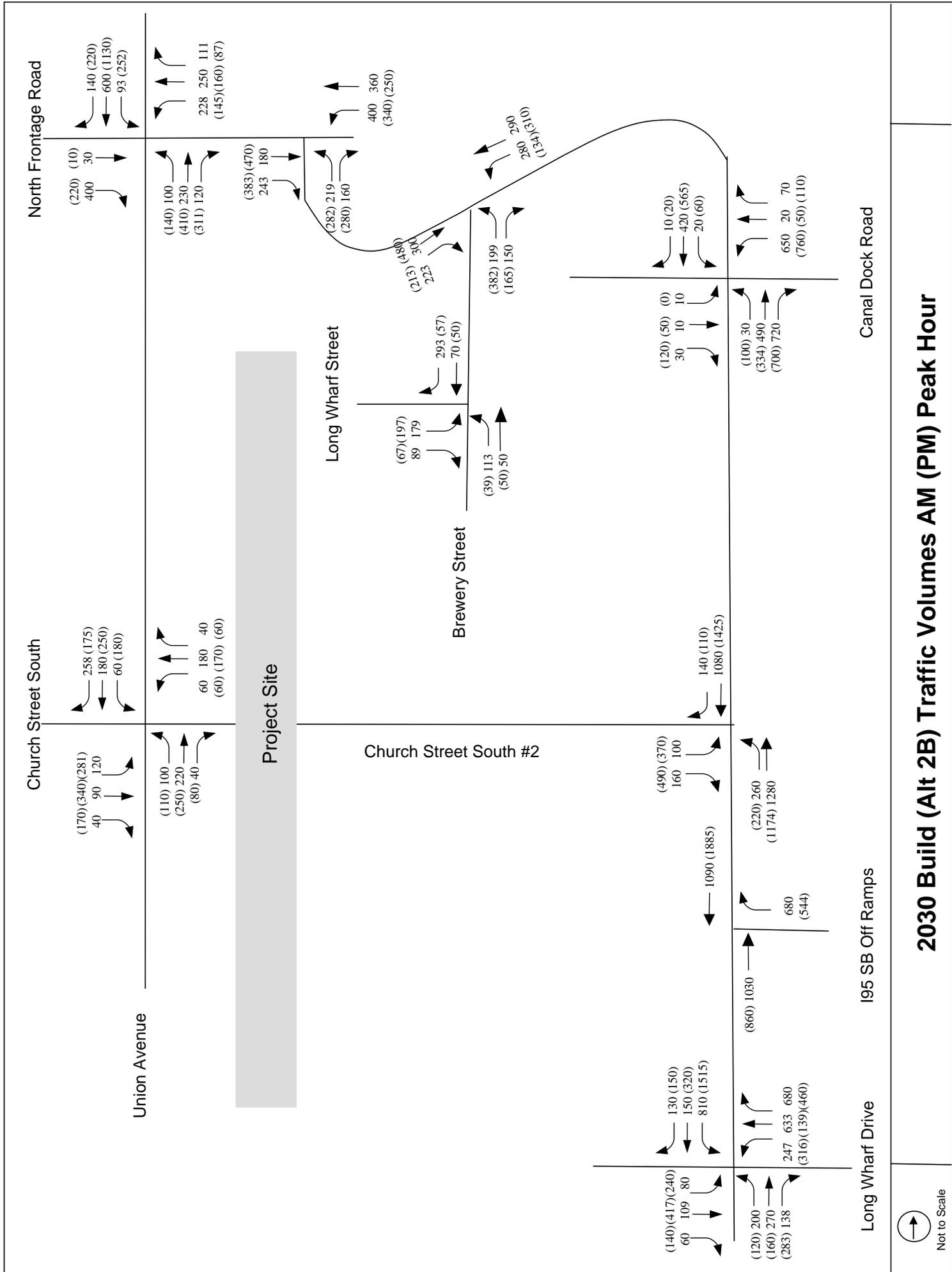












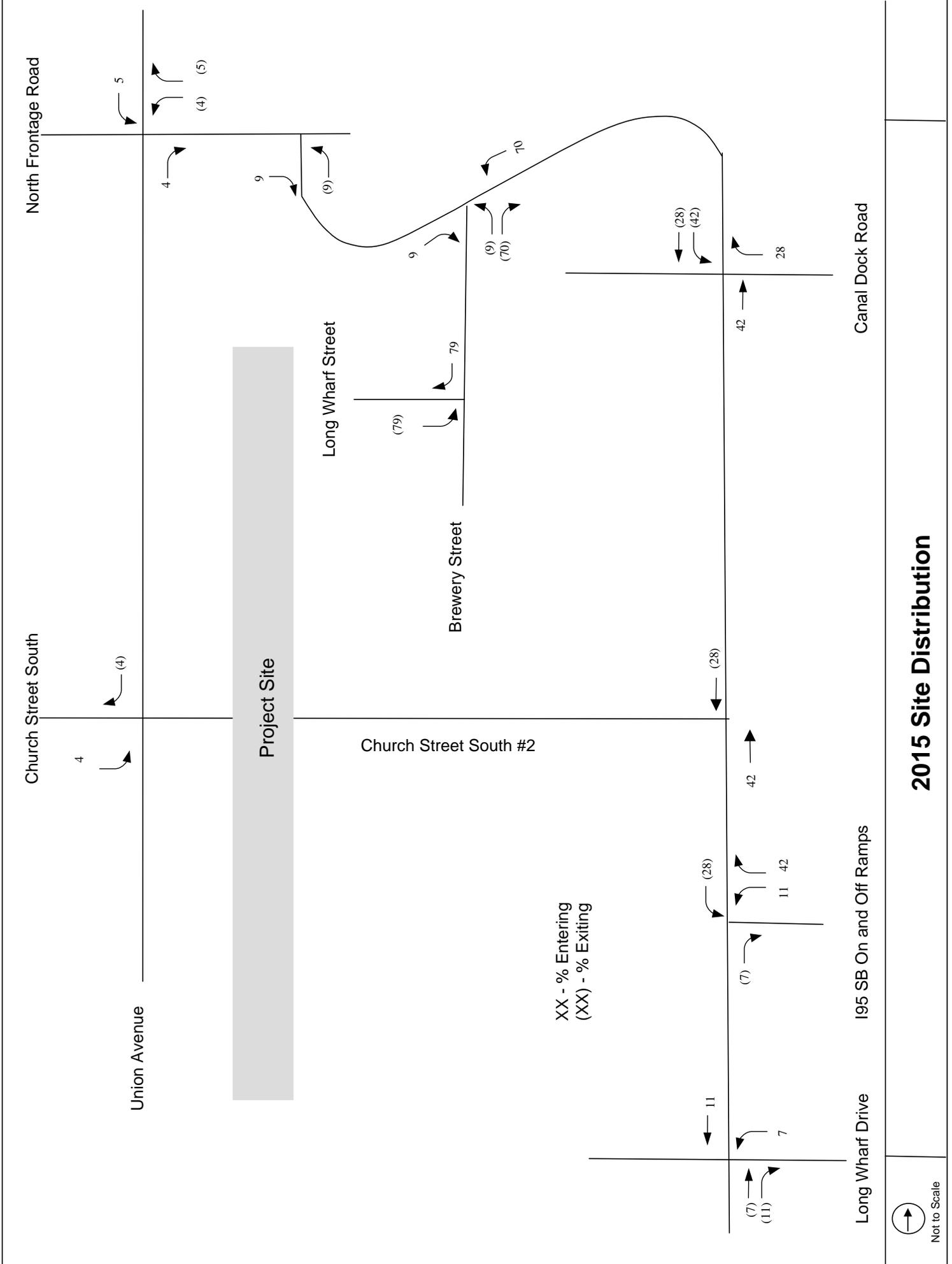


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**TRIP DISTRIBUTION & SITE GENERATED TRIPS**

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North Frontage Road

Church Street South

Union Avenue

Project Site

Church Street South #2

Long Wharf Street

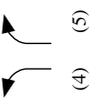
Brewery Street

Canal Dock Road

I95 SB On and Off Ramps

Long Wharf Drive

4



(79)



9



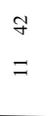
(28)



(28)



11



7

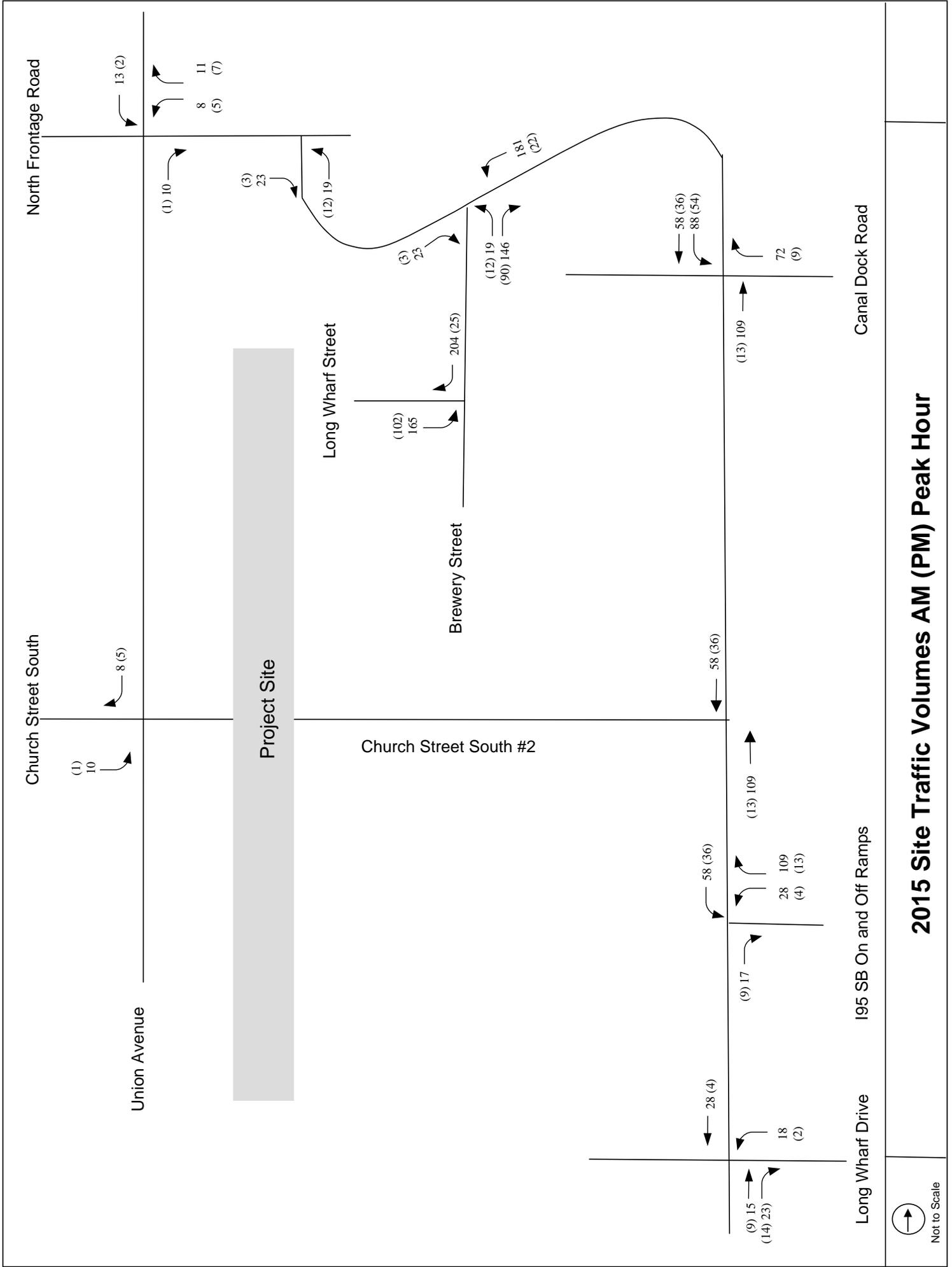


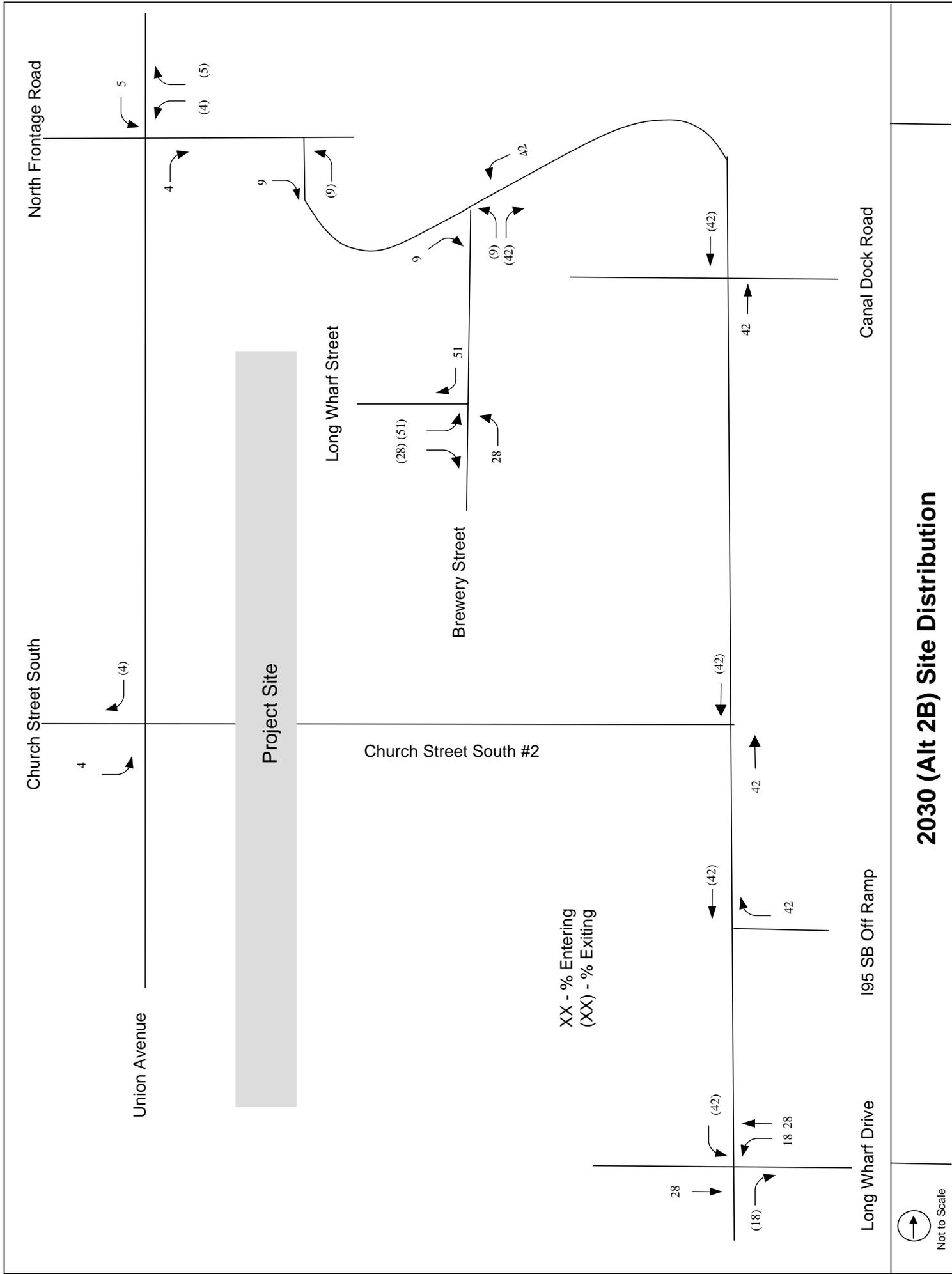
28



Not to Scale

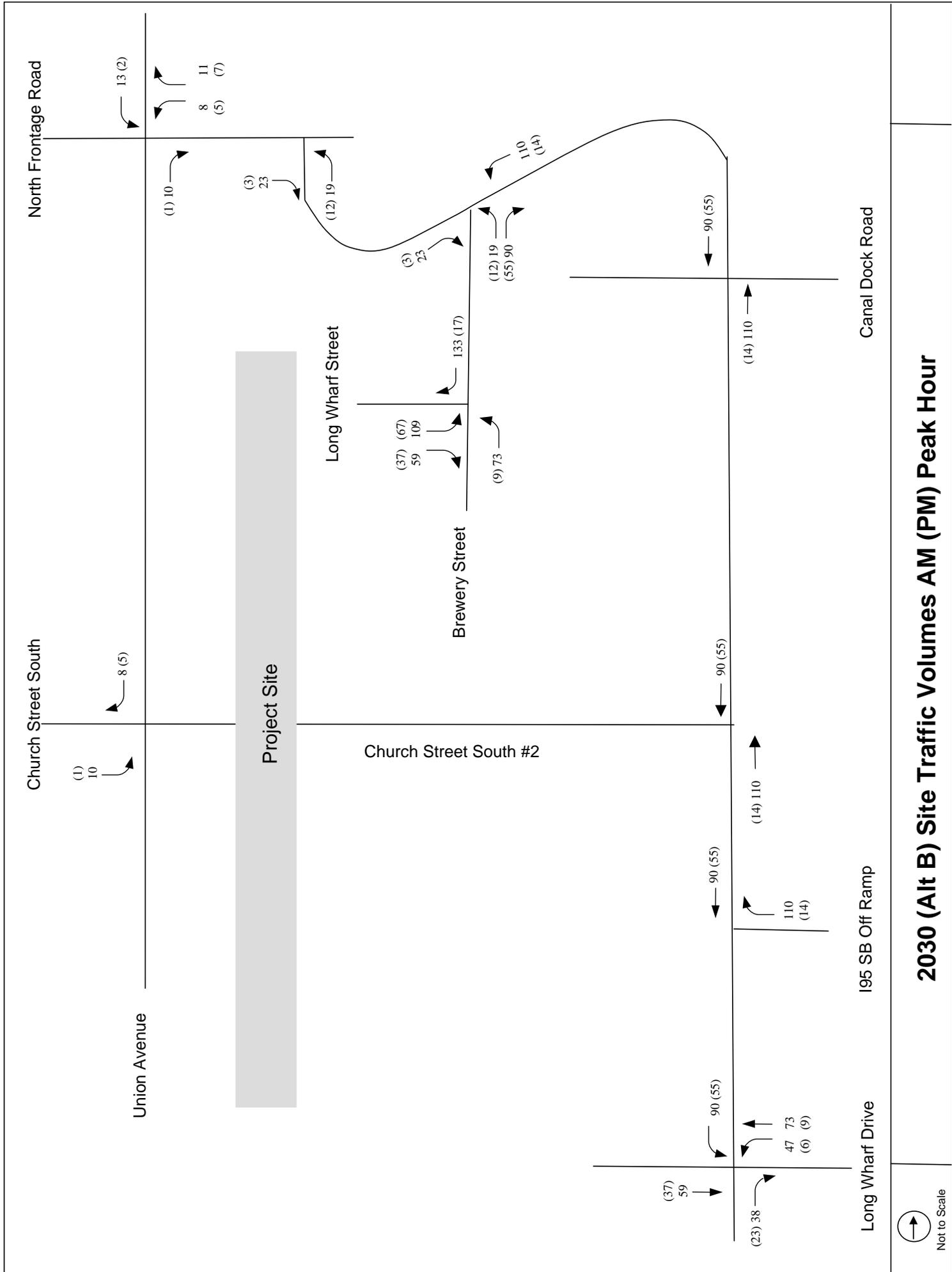
2015 Site Distribution





Not to Scale

**2030 (Alt 2B) Site Distribution**



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## **CRASH DATA**

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ConnDOT Crash Data (2003-2005)

Intersection/Segment	Total Number of Accidents	Number of Accidents Resulting in Injuries	Type of Collision	Number of Accidents
Church Street South at Union Avenue	17	3	Head On	6
			Rear End	4
			Sideswipe, Same Dir.	2
			Turning, Same Dir.	2
			Backing	1
			Pedestrian	1
			Turning, Intersecting	1
Union Street from Church Street South to Union Station Entrance	8	3	Rear End	2
			Turning, Intersecting	2
			Turning, Same Dir.	2
			Parking	1
			Sideswipe, Same Dir.	1
Union Street at Union Station Entrance	20	6	Sideswipe, Same Dir.	6
			Turning, Intersecting	4
			Rear End	3
			Head On	2
			Parking	2
			Backing	1
			Pedestrian	1
			Turning, Same Dir.	1
			Sideswipe, Opp. Dir.	0
			Union Street from Union Station Entrance to So. Parking Entrance	6
Parking	1			
Pedestrian	1			
Turning, Intersecting	1			
Union Street at So. Parking Garage Entrance	14	3	Head On	3
			Rear End	3
			Sideswipe, Same Dir.	3
			Turning, Intersecting	2
			Turning, Same Dir.	2
			Sideswipe, Opp. Dir.	1
Union Street from So. Parking Garage Ent. to Columbus Ave. #2	3	1	Backing	1
			Rear End	1
			Turning, Intersecting	1
Union Street at Columbus Ave. #2	14	5	Head On	5
			Rear End	3
			Sideswipe, Same Dir.	2
			Turning, Intersecting	2
			Parking	1
			Turning, Same Dir.	1
Union Street at N. Parking Garage Entrance	5	0	Sideswipe, Same Dir.	2
			Backing	1
			Parking	1
			Sideswipe, Opp. Dir.	1
Union Street from N. Parking Garage Entrance to Meadow Street	4	1	Sideswipe, Same Dir.	2
			Parking	1
			Pedestrian	1
Union Street at Meadow Street	6	1	Rear End	5
			Sideswipe, Same Dir.	1
Union Street from Meadow Street to West Water Street	21	3	Sideswipe, Same Dir.	7
			Rear End	4
			Parking	3
			Turning, Same Dir.	3
			Fixed Obj	2
			Head On	1
			Moving Obj	1



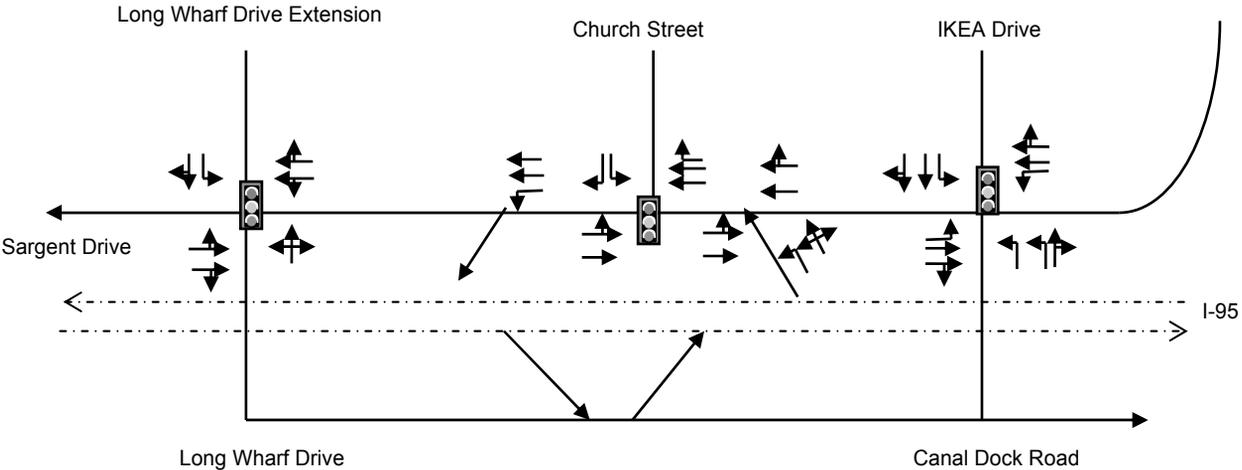
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## **SARGENT DRIVE ROADWAY CONFIGURATION**

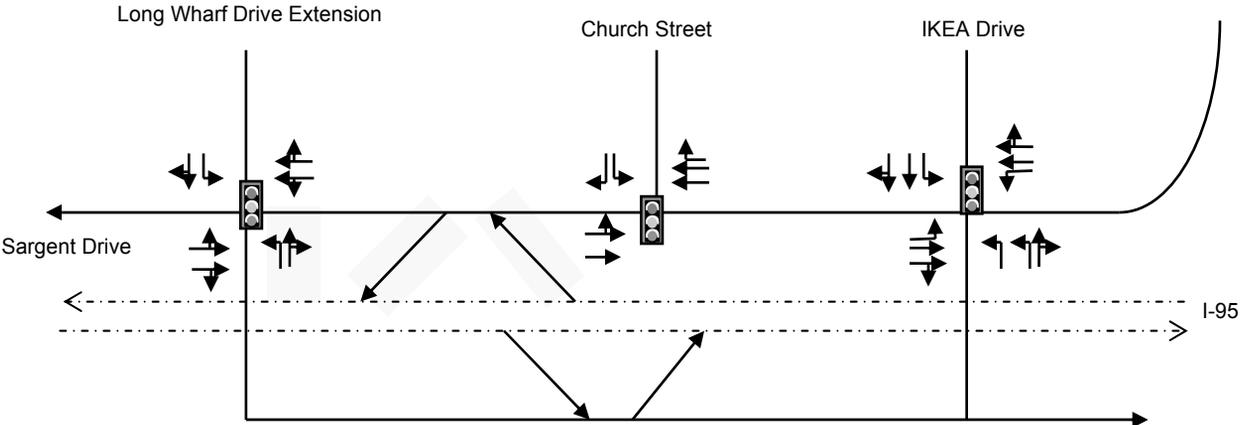
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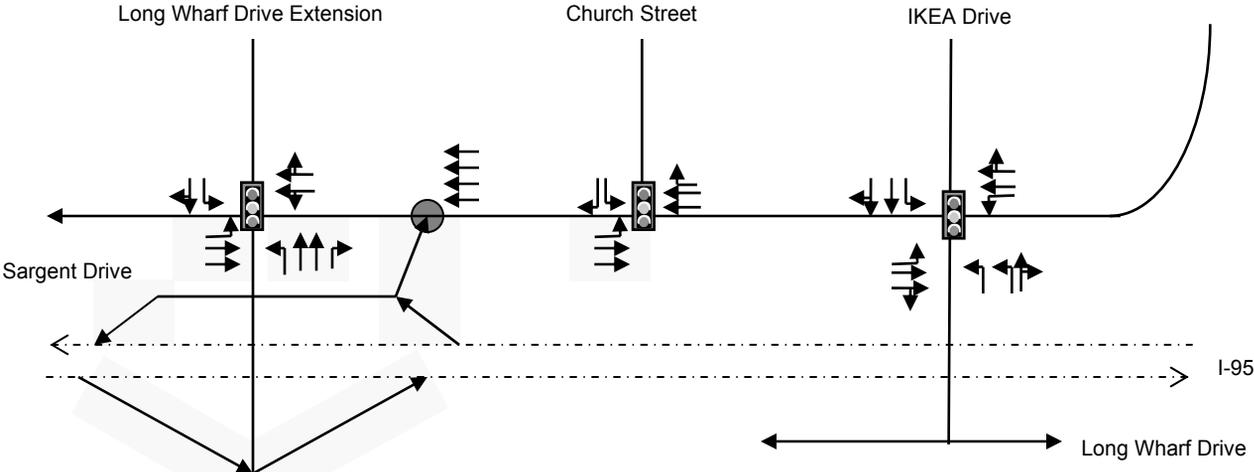
Existing Condition 2007



Design Year 2015



Design Year 2030





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**APPENDIX F: AIR QUALITY ANALYSIS**

---



**Attachment A**

**MOBILE6.2 Input and Output Files**



# MOBILE6.2 2015 Input File – New Haven Railyard

```
MOBILE6 INPUT FILE :
* For VOC CO and NOx
SPREADSHEET       :
DATABASE OUTPUT   :
POLLUTANTS        : HC CO NOX
DATABASE OPTIONS  : CTdb.opt

RUN DATA
> 2015 input file with 2002 registration data; created 4/8/05 PMB

>*****New Haven Expressway *****

* Northeast NLEV inputs
94+ LDG IMP       : NLEVNE.D

* Fuel Data
FUEL PROGRAM      : 2 N
NO REFUELING      :

REG DIST          : CTreg02.d

EXPRESS HC AS VOC :

* I/M Data; reflects assumed Agbar OBD/ASM/Idle tests
I/M DESC FILE    : CTIM05.d
ANTI-TAMP PROG   :
83 71 50 22222 21111111 1 12 096. 12111112

* VMT Data
VMT BY HOUR      : 2015Exp.def
SPEED VMT        : 20sdvmt6.cty
VMT BY FACILITY  : FCVMTF.CTY

* 2015 expressway/ramp VMT fractions
VMT FRACTIONS    :
0.2899 0.1056 0.3514 0.1083 0.0499 0.0301 0.0030 0.0025
0.0019 0.0068 0.0080 0.0087 0.0308 0.0015 0.0008 0.0008

SCENARIO RECORD  : New Haven County 2015 03 SEASON w/OBD/ASM/Idle I/M W/gascap, ATP, RFG2
CALENDAR YEAR    : 2015
EVALUATION MONTH : 1
FUEL RVP         : 13.0

* Weather Data for SWCT NA area
MIN/MAX TEMP     : 18. 44.
RELATIVE HUMIDITY : 73. 73. 73. 53. 53. 53. 40. 40. 40. 39. 39. 39.
                  54. 54. 54. 70. 70. 70. 78. 78. 78. 87. 87. 87.

END OF RUN

>*****New Haven Arterials/Collectors *****

* Northeast NLEV inputs
94+ LDG IMP       : NLEVNE.D

* Fuel Data
FUEL PROGRAM      : 2 N
NO REFUELING      :

REG DIST          : CTreg02.d

EXPRESS HC AS VOC :

* I/M Data; reflects assumed Agbar OBD/ASM/Idle tests
I/M DESC FILE    : CTIM05.d
ANTI-TAMP PROG   :
83 71 50 22222 21111111 1 12 096. 12111112

* VMT Data
VMT BY HOUR      : 2015Art.def
SPEED VMT        : 20sdvmt6.cty
VMT BY FACILITY  : FCVMTA.CTY

* 2015 arterial/collector VMT fractions
VMT FRACTIONS    :
0.3100 0.1128 0.3754 0.1157 0.0532 0.0100 0.0010 0.0008
0.0006 0.0022 0.0026 0.0029 0.0102 0.0005 0.0003 0.0018

SCENARIO RECORD  : New Haven County 2015 03 SEASON w/OBD/ASM/Idle I/M W/gascap, ATP, RFG2
CALENDAR YEAR    : 2015
```

EVALUATION MONTH : 1  
FUEL RVP : 13.0  
  
\* Weather Data for SWCT NA area  
MIN/MAX TEMP : 18. 44.  
RELATIVE HUMIDITY : 73. 73. 73. 53. 53. 53. 40. 40. 40. 39. 39. 39.  
54. 54. 54. 70. 70. 70. 78. 78. 78. 87. 87. 87.

END OF RUN

>\*\*\*\*\*New Haven Local \*\*\*\*\*

\* Northeast NLEV inputs  
94+ LDG IMP : NLEVNE.D

\* Fuel Data  
FUEL PROGRAM : 2 N  
NO REFUELING :

REG DIST : CTreg02.d

EXPRESS HC AS VOC :

\* I/M Data; reflects assumed Agbar OBD/ASM/Idle tests  
I/M DESC FILE : CTIM05.d  
ANTI-TAMP PROG :  
83 71 50 22222 21111111 1 12 096. 12111112

\* VMT Data  
VMT BY HOUR : 2015Loc.def  
SPEED VMT : 20sdvmt6.cty  
VMT BY FACILITY : FVMTL.CTY

\* 2015 Local VMT fractions  
VMT FRACTIONS :  
0.3119 0.1134 0.3775 0.1163 0.0535 0.0085 0.0008 0.0007  
0.0005 0.0019 0.0023 0.0025 0.0087 0.0004 0.0002 0.0009

SCENARIO RECORD : New Haven County 2015 03 SEASON w/OBD/ASM/Idle I/M W/gascap, ATP, RFG2  
CALENDAR YEAR : 2015  
EVALUATION MONTH : 1  
FUEL RVP : 13.0

\* Weather Data for SWCT NA area  
MIN/MAX TEMP : 18. 44.  
RELATIVE HUMIDITY : 73. 73. 73. 53. 53. 53. 40. 40. 40. 39. 39. 39.  
54. 54. 54. 70. 70. 70. 78. 78. 78. 87. 87. 87.

END OF RUN

>\*\*\*\*\*New Haven Ramp \*\*\*\*\*

\* Northeast NLEV inputs  
94+ LDG IMP : NLEVNE.D

\* Fuel Data  
FUEL PROGRAM : 2 N  
NO REFUELING :

REG DIST : CTreg02.d

EXPRESS HC AS VOC :

\* I/M Data; reflects assumed Agbar OBD/ASM/Idle tests  
I/M DESC FILE : CTIM05.d  
ANTI-TAMP PROG :  
83 71 50 22222 21111111 1 12 096. 12111112

\* VMT Data  
VMT BY HOUR : 2015Exp.def  
SPEED VMT : 20sdvmt6.cty  
VMT BY FACILITY : FVMTTR.CTY

\* 2015 expressway/ramp VMT fractions  
VMT FRACTIONS :  
0.2899 0.1056 0.3514 0.1083 0.0499 0.0301 0.0030 0.0025  
0.0019 0.0068 0.0080 0.0087 0.0308 0.0015 0.0008 0.0008

SCENARIO RECORD : New Haven County 2015 03 SEASON w/OBD/ASM/Idle I/M W/gascap, ATP, RFG2  
CALENDAR YEAR : 2015  
EVALUATION MONTH : 1  
FUEL RVP : 13.0

\* Weather Data for SWCT NA area  
MIN/MAX TEMP : 18. 44.  
RELATIVE HUMIDITY : 73. 73. 73. 53. 53. 53. 40. 40. 40. 39. 39. 39.  
54. 54. 54. 70. 70. 70. 78. 78. 78. 87. 87. 87.

END OF RUN

MOBILE6 INPUT FILE :  
\* For VOC CO and NOx  
SPREADSHEET :  
DATABASE OUTPUT :  
POLLUTANTS : HC CO NOX  
DATABASE OPTIONS : CTdb.opt

RUN DATA

> 2015 input file with 2002 registration data; created 4/8/05 PMB

>\*\*\*\*\*New Haven Expressway \*\*\*\*\*

\* Northeast NLEV inputs

94+ LDG IMP : NLEVNE.D

\* Fuel Data

FUEL PROGRAM : 2 N  
NO REFUELING :

REG DIST : CTreg02.d

EXPRESS HC AS VOC :

\* I/M Data; reflects assumed Agbar OBD/ASM/Idle tests

I/M DESC FILE : CTIM05.d  
ANTI-TAMP PROG :  
83 71 50 22222 21111111 1 12 096. 12111112

\* VMT Data

VMT BY HOUR : 2015Exp.def  
SPEED VMT : 20sdvmt6.cty  
VMT BY FACILITY : FCVMTF.CTY

\* 2015 expressway/ramp VMT fractions

VMT FRACTIONS :  
0.2899 0.1056 0.3514 0.1083 0.0499 0.0301 0.0030 0.0025  
0.0019 0.0068 0.0080 0.0087 0.0308 0.0015 0.0008 0.0008

SCENARIO RECORD : New Haven County 2015 03 SEASON w/OBD/ASM/Idle I/M W/gascap, ATP, RFG2  
CALENDAR YEAR : 2015  
EVALUATION MONTH : 1  
FUEL RVP : 13.0

\* Weather Data for SWCT NA area

MIN/MAX TEMP : 18. 44.  
RELATIVE HUMIDITY : 73. 73. 73. 53. 53. 53. 40. 40. 40. 39. 39. 39.  
54. 54. 54. 70. 70. 70. 78. 78. 78. 87. 87. 87.

END OF RUN

>\*\*\*\*\*New Haven Arterials/Collectors \*\*\*\*\*

\* Northeast NLEV inputs

94+ LDG IMP : NLEVNE.D

\* Fuel Data

FUEL PROGRAM : 2 N  
NO REFUELING :

REG DIST : CTreg02.d

EXPRESS HC AS VOC :

\* I/M Data; reflects assumed Agbar OBD/ASM/Idle tests

I/M DESC FILE : CTIM05.d  
ANTI-TAMP PROG :  
83 71 50 22222 21111111 1 12 096. 12111112

\* VMT Data

VMT BY HOUR : 2015Art.def  
SPEED VMT : 20sdvmt6.cty  
VMT BY FACILITY : FCVMTA.CTY

\* 2015 arterial/collector VMT fractions

VMT FRACTIONS :  
0.3100 0.1128 0.3754 0.1157 0.0532 0.0100 0.0010 0.0008

0.0006 0.0022 0.0026 0.0029 0.0102 0.0005 0.0003 0.0018

SCENARIO RECORD : New Haven County 2015 03 SEASON w/OBD/ASM/idle I/M W/gascap, ATP, RFG2  
CALENDAR YEAR : 2015  
EVALUATION MONTH : 1  
FUEL RVP : 13.0

\* Weather Data for SWCT NA area  
MIN/MAX TEMP : 18. 44.  
RELATIVE HUMIDITY : 73. 73. 73. 53. 53. 53. 40. 40. 40. 39. 39. 39.  
54. 54. 54. 70. 70. 70. 78. 78. 78. 87. 87. 87.

END OF RUN

>\*\*\*\*\*New Haven Local \*\*\*\*\*

\* Northeast NLEV inputs  
94+ LDG IMP : NLEVNE.D

\* Fuel Data  
FUEL PROGRAM : 2 N  
NO REFUELING :

REG DIST : CTreg02.d

EXPRESS HC AS VOC :

\* I/M Data; reflects assumed Agbar OBD/ASM/Idle tests  
I/M DESC FILE : CTIM05.d  
ANTI-TAMP PROG :  
83 71 50 22222 21111111 1 12 096. 12111112

\* VMT Data  
VMT BY HOUR : 2015Loc.def  
SPEED VMT : 20sdvmt6.cty  
VMT BY FACILITY : FCVMTL.CTY

\* 2015 Local VMT fractions  
VMT FRACTIONS :  
0.3119 0.1134 0.3775 0.1163 0.0535 0.0085 0.0008 0.0007  
0.0005 0.0019 0.0023 0.0025 0.0087 0.0004 0.0002 0.0009

SCENARIO RECORD : New Haven County 2015 03 SEASON w/OBD/ASM/idle I/M W/gascap, ATP, RFG2  
CALENDAR YEAR : 2015  
EVALUATION MONTH : 1  
FUEL RVP : 13.0

\* Weather Data for SWCT NA area  
MIN/MAX TEMP : 18. 44.  
RELATIVE HUMIDITY : 73. 73. 73. 53. 53. 53. 40. 40. 40. 39. 39. 39.  
54. 54. 54. 70. 70. 70. 78. 78. 78. 87. 87. 87.

END OF RUN

>\*\*\*\*\*New Haven Ramp \*\*\*\*\*

\* Northeast NLEV inputs  
94+ LDG IMP : NLEVNE.D

\* Fuel Data  
FUEL PROGRAM : 2 N  
NO REFUELING :

REG DIST : CTreg02.d

EXPRESS HC AS VOC :

\* I/M Data; reflects assumed Agbar OBD/ASM/Idle tests  
I/M DESC FILE : CTIM05.d  
ANTI-TAMP PROG :  
83 71 50 22222 21111111 1 12 096. 12111112

\* VMT Data  
VMT BY HOUR : 2015Exp.def  
SPEED VMT : 20sdvmt6.cty  
VMT BY FACILITY : FCVMTR.CTY

\* 2015 expressway/ramp VMT fractions  
VMT FRACTIONS :  
0.2899 0.1056 0.3514 0.1083 0.0499 0.0301 0.0030 0.0025  
0.0019 0.0068 0.0080 0.0087 0.0308 0.0015 0.0008 0.0008

SCENARIO RECORD : New Haven County 2015 03 SEASON w/OBD/ASM/idle I/M W/gascap, ATP, RFG2

CALENDAR YEAR : 2015  
EVALUATION MONTH : 1  
FUEL RVP : 13.0

\* Weather Data for SWCT NA area

MIN/MAX TEMP : 18. 44.  
RELATIVE HUMIDITY : 73. 73. 73. 53. 53. 53. 40. 40. 40. 39. 39. 39.  
54. 54. 54. 70. 70. 70. 78. 78. 78. 87. 87. 87.

END OF RUN





LEV phase-in data read from file NLEVNE.D

Calendar Year: 2015  
 Month: Jan.  
 Altitude: Low  
 Minimum Temperature: 18.0 (F)  
 Maximum Temperature: 44.0 (F)  
 Minimum Rel. Hum.: 39.0 (%)  
 Maximum Rel. Hum.: 87.0 (%)  
 Fuel Sul Fur Content: 90. ppm

Exhaust I/M Program: Yes  
 Evap I/M Program: Yes  
 ATP Program: Yes  
 Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:	<6000	>6000								
VMT Distribution:	0.2895	0.4570	0.1559		0.0280	0.0004	0.0023	0.0661	0.0008	1.0000

Composite Emission Factors (g/ml):

Composite VOC : 0.697 0.636 0.934 0.712 0.704 0.396 0.379 0.362 4.06 0.686  
 Composite CO : 24.63 27.37 25.32 26.85 14.27 1.315 0.781 2.362 18.74 24.157  
 Composite NOX : 1.204 1.486 1.915 1.595 5.735 1.514 1.516 17.017 2.90 2.618

\*\*\*\*\*  
 \* MOBILE6.2.01 (31-Oct-2002) \*  
 \* Input file: HRT2015.IN (file 1, run 2). \*  
 \* \*\*\*\*\*New Haven Arterials/Collectors \*\*\*\*\*  
 \* \*\*\*\*\*

\* Reading 94+ LEV IMPLEMENTATION SCHEDULE from the following external  
 \* data file: NLEVNE.D  
 \* M616 Comment: User has supplied post-1999 sulfur levels.

M603 Comment: User has disabled the calculation of REFUELING emissions.

\* Reading Registration Distributions from the following external  
 \* data file: CTREG02.D

\* Reading I/M program description records from the following external  
 \* data file: CTIM05.D  
 \* CT I/M PROGRAMS for all years 2015 and later (modified Jun 05 PMB/AG to reflect DMV info that 8,501-10,000 lb get TSI & GC (no OBD)  
 \* Biennial OBD I I/M "tailpipe" test for post-MY1995 gasoline vehicles up to 8,500 lbs GVWR. Program start year reflects OBD test that  
 replaced the ASM  
 \* Biennial OBD I evaporative "test" for post-MY1995 gasoline vehicles up to 8,500 lbs GVWR  
 \* Biennial 2500/IDLE I/M tailpipe test for all HDGT 8,501 - 10,000 lbs GVWR (per above comment)  
 \* Biennial GC evaporative "test" for all HDGT 8,501 - 10,000 lbs (per above comment)  
 \* Biennial ASM I/M tailpipe test for pre-96 gasoline vehicles up to 8,500 lbs GVWR

\* Reading ASM I/M Test Credits from ASMDATA.D  
 \* Biennial Gas Cap evaporative test for pre-96 gasoline vehicles up to 8,500 lbs GVWR

\* Reading Hourly VMT distribution from the following external  
 \* data file: 2015ART.DEF

\* Reading Hourly, Roadway, and Speed VMT dist. from the following external data file: 20SDVMT6.CTY

\* Reading Hourly Roadway VMT distribution from the following external data file: FCVMTA.CTY

Reading User Supplied ROADWAY VMT Factors  
M615 Comment: User supplied VMT mix.

\* \* \* \* \*  
\* New Haven County 2015 03 SEASON w/OBD/ASM/Idle I/M W/gascap, ATP, RFG2  
\* File 1, Run 2, Scenario 1.  
\* \* \* \* \*

M112 Warning: Wintertime Reformulated Gasoline Rules Apply  
\*\*\* I/M credits for Tech1&2 vehicles were read from the following external data file: TECH12.D  
M 48 Warning: there are no sales for vehicle class HDGV8b

LEV phase-in data read from file NLEVNE.D

Calendar Year: 2015  
Month: Jan.  
Altitude: Low  
Minimum Temperature: 18.0 (F)  
Maximum Temperature: 44.0 (F)  
Minimum Rel. Hum.: 39.0 (%)  
Maximum Rel. Hum.: 87.0 (%)  
Fuel Sul Fur Content: 90. ppm

Exhaust I/M Program: Yes  
Evap I/M Program: Yes  
ATP Program: Yes  
Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:	<6000	>6000	>6000	(All)						
VMT Distribution:	0.3096	0.4882	0.1665		0.0092	0.0004	0.0025	0.0219	0.0018	1.0000

Composite Emission Factors (g/ml):  
Composite VOC : 0.787 0.719 1.061 0.806 1.133 0.482 0.491 0.532 0.802  
Composite CO : 21.78 24.19 22.38 23.73 13.69 1.414 0.856 2.747 15.60 22.491  
Composite NOX : 1.126 1.405 1.848 1.517 4.828 0.998 0.988 10.181 2.20 1.616

\* MOBILE6.2.01 (31-Oct-2002)  
\* Input file: HRT2015.IN (file 1, run 3).  
\* \* \* \* \*  
\* \* \* \* \*New Haven Local \* \* \* \* \*

\* Reading 94+ LEV IMPLEMENTATION SCHEDULE from the following external data file: NLEVNE.D  
M616 Comment: User has supplied post-1999 sulfur levels.  
M603 Comment: User has disabled the calculation of REFUELING emissions.



GVWR:		<6000		>6000		(All)				
VMT Distribution:		0.3115	0.4909	0.1673	0.0079	0.0004	0.0025	0.0186	0.0009	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	1.018	0.918	1.343	1.026	2.796	0.741	0.830	1.046	5.38	1.041
Composite CO :	18.95	21.11	19.81	20.78	32.07	2.369	1.586	6.398	28.26	19.984
Composite NOx :	1.024	1.297	1.735	1.408	4.001	1.260	1.256	11.638	1.81	1.500

\*\*\*\*\*  
 \* MOBILE6.2.01 (31-Oct-2002) \*  
 \* Input file: HRT2015.IN (file 1, run 4). \*  
 \* \*\*\*\*\*New Haven Ramp \*\*\*\*\*

\* Reading 94+ LEV IMPLEMENTATION SCHEDULE from the following external  
 data file: NLEVNE.D  
 M616 Comment: User has supplied post-1999 sulfur levels.

M603 Comment: User has supplied the calculation of REFUELING emissions.

\* Reading Registration Distributions from the following external  
 data file: CTREG02.D

\* Reading I/M program description records from the following external  
 data file: CTIM05.D  
 \* CT I/M PROGRAMS for all years 2015 and later (modified Jun 05 PNB/AG to reflect DMV info that 8,501-10,000 lb get TSI & GC (no OBD)  
 \* Biennial OBDII I/M "tailpipe" test for post-MY1995 gasoline vehicles up to 8,500 lbs GVWR. Program start year reflects OBD test that replaced the ASM  
 \* Biennial OBDII evaporative "test" for post-MY1995 gasoline vehicles up to 8,500 lbs GVWR  
 \* Biennial 2500/IDLE I/M tailpipe test for all HDGT 8,501 - 10,000 lbs GVWR (per above comment)  
 \* Biennial GC evaporative "test" for all HDGT 8,501 - 10,000 lbs (per above comment)  
 \* Biennial ASM I/M tailpipe test for pre-96 gasoline vehicles up to 8,500 lbs GVWR

\* Reading ASM I/M Test Credits from ASMDATA.D  
 \* Biennial Gas Cap evaporative test for pre-96 gasoline vehicles up to 8,500 lbs GVWR

\* Reading Hourly VMT distribution from the following external  
 data file: 2015EXP.DEF

\* Reading Hourly Roadway, and Speed VMT dist. from the following external  
 data file: 20SDVMT6.CTY

\* Reading Hourly Roadway VMT distribution from the following external  
 data file: FCVMT6.CTY

Reading User Supplied ROADWAY VMT Factors  
 M615 Comment: User supplied VMT mix.

\* \* \* \* \*  
 \* New Haven County 2015 03 SEASON w/OBD/ASM/idle I/M W/gascap, ATP, RFG2  
 \* File 1, Run 4, Scenario 1.  
 \* \* \* \* \*  
 M112 Warning: Wintertime Reformulated Gasoline Rules Apply

\*\*\* I/M credits for Tech1&2 vehicles were read from the following external data file: TECH12.D  
 M 48 Warning: there are no sales for vehicle class HDGV8b

LEV phase-in data read from file NLEVNE.D

Calendar Year: 2015  
 Month: Jan.  
 Altitude: Low  
 Minimum Temperature: 18.0 (F)  
 Maximum Temperature: 44.0 (F)  
 Minimum Rel. Hum.: 39.0 (%)  
 Maximum Rel. Hum.: 87.0 (%)  
 Fuel Sulfur Content: 90. ppm  
 Exhaust I/M Program: Yes  
 Evap I/M Program: Yes  
 ATP Program: Yes  
 Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:	<6000	>6000	>6000	(All)						
VMT Distribution:	0.2895	0.4570	0.1559		0.0280	0.0004	0.0023	0.0661	0.0008	1.0000
Composite Emission Factors (g/mi):										
Composite VOC :	0.901	0.829	1.172	0.916	0.992	0.464	0.469	0.498	3.86	0.887
Composite CO :	31.12	32.48	29.87	31.82	11.87	1.330	0.792	2.418	14.24	29.017
Composite NOX :	1.370	1.636	2.115	1.758	4.810	0.940	0.929	8.835	2.21	2.197

\*\*\*\*\*  
 \* MOBILE6.2.01 (31-Oct-2002)  
 \* Input file: MDSX2015.IN (file 1, run 1).  
 \* \*\*\*\*\*  
 \* 2015 input file with 2002 registration data; created 4/8/05 PMB  
 \* \*\*\*\*\*New Haven Expressway \*\*\*\*\*

\* Reading 94+ LEV IMPLEMENTATION SCHEDULE from the following external data file: NLEVNE.D  
 M616 Comment: User has supplied post-1999 sulfur levels.  
 M603 Comment: User has disabled the calculation of REFUELING emissions.

\* Reading Registration Distributions from the following external data file: CTREG02.D

\* Reading I/M program description records from the following external data file: CTIM05.D  
 \* CT I/M PROGRAMS for all years 2015 and later (modified Jun 05 PMB/AG to reflect DMV info that 8,501-10,000 lb get TSI & GC (no OBD)  
 \* Biennial OBD I I/M "tailpipe" test for post-MY1995 gasoline vehicles up to 8,500 lbs GVWR. Program start year reflects OBD test that replaced the ASM  
 \* Biennial OBD I evaporative "test" for post-MY1995 gasoline vehicles up to 8,500 lbs GVWR  
 \* Biennial 2500/I DLE I/M tailpipe test for all HDGT 8,501 - 10,000 lbs GVWR (per above comment)  
 \* Biennial GC evaporative "test" for all HDGT 8,501 - 10,000 lbs (per above comment)  
 \* Biennial ASM I/M tailpipe test for pre-96 gasoline vehicles up to 8,500 lbs GVWR

\* Reading ASM I/M Test Credits from ASMDATA.D  
 \*Biennial Gas Cap evaporative test for pre-96 gasoline vehicles up to 8,500 lbs GWMR  
 \* Reading Hourly VMT distribution from the following external  
 \* data file: 2015EXP.DEF

\* Reading Hourly Roadway, and Speed VMT dist. from the following external  
 \* data file: 20SDVMT6.CTY  
 \* Reading Hourly Roadway VMT distribution from the following external  
 \* data file: FCVMTF.CTY

Reading User Supplied ROADWAY VMT Factors  
 M615 Comment: User supplied VMT mi x.

\* \* \* \* \*  
 \* New Haven County 2015 03 SEASON w/OBD/ASM/idle I/M w/gascap, ATP, RFG2  
 \* File 1, Run 1, Scenario 1.  
 \* \* \* \* \*  
 M112 Warning:

\*\*\* I/M credits for Wintertime Reformulated Gasoline Rules Apply  
 data file: TECH12.D  
 M 48 Warning: there are no sales for vehicle class HDGV8b

LEV phase-in data read from file NLEVNE.D  
 Calendar Year: 2015

Month: Jan.  
 Altitude: Low  
 Minimum Temperature: 18.0 (F)  
 Maximum Temperature: 44.0 (F)  
 Minimum Rel. Hum.: 39.0 (%)  
 Maximum Rel. Hum.: 87.0 (%)  
 Fuel Sulfur Content: 90. ppm

Exhaust I/M Program: Yes  
 Evap I/M Program: Yes  
 ATP Program: Yes  
 Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GWMR:	<6000	>6000	>6000	(All)						
VMT Distribution:	0.2895	0.4570	0.1559		0.0280	0.0004	0.0023	0.0661	0.0008	1.0000

Composite Emission Factors (g/mi):

Composite VOC :	0.697	0.636	0.934	0.712	0.704	0.396	0.379	0.362	4.06	0.686
Composite CO :	24.63	27.37	25.32	26.85	14.27	1.315	0.781	2.362	18.74	24.157
Composite NOx :	1.204	1.486	1.915	1.595	5.735	1.514	1.516	17.017	2.90	2.618

\*\*\*\*\*  
 \* MOBILE6.2.01 (31-Oct-2002) \*  
 \* Input file: MDSX2015.IN (file 1, run 2) \*  
 \*\*\*\*\*  
 \*\*\*\*\*New Haven Arterials/Collctors \*\*\*\*\*

```

* * Reading 94+ LEV IMPLEMENTATION SCHEDULE from the following external
* * data file: NLEVNE.D
M616 Comment: User has supplied post-1999 sulfur levels.
M603 Comment: User has disabled the calculation of REFUELING emissions.

* * Reading Registration Distributions from the following external
* * data file: CTREG02.D

* * Reading I/M program description records from the following external
* * data file: CTIM05.D
* * CT I/M PROGRAMS for all years 2015 and later (modified Jun 05 PMB/AG to reflect DMV info that 8,501-10,000 lbs get TSI & GC (no OBD)
* * Biennial OBD I I/M "tailpipe" test for post-MY1995 gasoline vehicles up to 8,500 lbs GVWR. Program start year reflects OBD test that
* * replaced the ASM
* * Biennial OBD I evaporative "test" for post-MY1995 gasoline vehicles up to 8,500 lbs GVWR
* * Biennial 2500/IDLE I/M tailpipe test for all HDGT 8,501 - 10,000 lbs GVWR (per above comment)
* * Biennial GC evaporative "test" for all HDGT 8,501 - 10,000 lbs (per above comment)
* * Biennial ASM I/M tailpipe test for pre-96 gasoline vehicles up to 8,500 lbs GVWR

* * Reading ASM I/M Test Credits from ASMDATA.D
* * Biennial Gas Cap evaporative test for pre-96 gasoline vehicles up to 8,500 lbs GVWR

* * Reading Hourly VMT distribution from the following external
* * data file: 2015ART.DEF

* * Reading Hourly, Roadway, and Speed VMT dist. from the following external
* * data file: 20SDVMT6.CTY

* * Reading Hourly Roadway VMT distribution from the following external
* * data file: FCVMTA.CTY

Reading User Supplied ROADWAY VMT Factors
M615 Comment: User supplied VMT mi x.
* * * * *
* * New Haven County 2015 03 SEASON w/OBD/ASM/idle I/M w/gascap, ATP, RFG2
* * File 1, Run 2, Scenario 1.
* * * * *
M112 Warning: Wintertime Reformulated Gasoline Rules Apply
*** I/M credits for Tech1&2 vehicles were read from the following external
data file: TECH12.D
M 48 Warning: there are no sales for vehicle class HDGV8b

LEV phase-in data read from file NLEVNE.D
Calendar Year: 2015
Month: Jan.
Altitude: Low
Minimum Temperature: 18.0 (F)
Maximum Temperature: 44.0 (F)
Minimum Rel. Hum.: 39.0 (%)
Maximum Rel. Hum.: 87.0 (%)
Fuel Sulfur Content: 90. ppm

```

Exhaust I/M Program: Yes  
 I/M Program: Yes  
 Evap I/M Program: Yes  
 ATP Program: Yes  
 Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVMR:	<6000	>6000								
VMT Distribution:	0.3096	0.4882	0.1665		0.0092	0.0004	0.0025	0.0219	0.0018	1.0000

Composite Emission Factors (g/ml):

Composite VOC : 0.787 0.719 1.061 0.806 1.133 0.482 0.491 0.532 4.01 0.802  
 Composite CO : 21.78 24.19 22.38 23.73 13.69 1.414 0.856 2.747 15.60 22.491  
 Composite NOx : 1.126 1.405 1.848 1.517 4.828 0.998 0.988 10.181 2.20 1.616

\*\*\*\*\*  
 \* MOBILE6.2.01 (31-Oct-2002) \*  
 \* Input file: MDSX2015.IN (file 1, run 3). \*  
 \* \*\*\*\*\*New Haven Local \*\*\*\*\* \*  
 \* \*\*\*\*\*

\* Reading 94+ LEV IMPLEMENTATION SCHEDULE from the following external  
 data file: NLEVNE.D  
 M616 Comment:

M603 Comment: User has supplied post-1999 sulfur levels.  
 User has disabled the calculation of REFUELING emissions.

\* Reading Registration Distributions from the following external  
 data file: CTREG02.D

\* Reading I/M program description records from the following external  
 data file: CTIM05.D

\* CT I/M PROGRAMS for all years 2015 and later (modified Jun 05 PMB/AG to reflect DMV info that 8,501-10,000 lbs get TSI & GC (no OBD)  
 \* Biennial OBD I/M "tailpipe" test for post-MY1995 gasoline vehicles up to 8,500 lbs GVMR. Program start year reflects OBD test that  
 replaced the ASM

\* Biennial OBD I evaporative "test" for post-MY1995 gasoline vehicles up to 8,500 lbs GVMR  
 \* Biennial 2500/IDLE I/M tailpipe test for all HDGT 8,501 - 10,000 lbs GVMR (per above comment)  
 \* Biennial GC evaporative "test" for all HDGT 8,501 - 10,000 lbs (per above comment)  
 \* Biennial ASM I/M tailpipe test for pre-96 gasoline vehicles up to 8,500 lbs GVMR

\* Reading ASM I/M Test Credits from ASMDATA.D  
 \* Biennial Gas Cap evaporative test for pre-96 gasoline vehicles up to 8,500 lbs GVMR

\* Reading Hourly VMT distribution from the following external  
 data file: 2015LOC.DEF

\* Reading Hourly, Roadway, and Speed VMT dist. from the following external  
 data file: 20SDVMT6.CTY

\* Reading Hourly Roadway VMT distribution from the following external  
 data file: FCVMTL.CTY

Reading User Supplied ROADWAY VMT Factors  
 M615 Comment: User supplied VMT mi x.

\* \* \* \* \*  
 \* New Haven County 2015 03 SEASON w/OBD/ASM/Idle I/M W/gascap, ATP, RFG2  
 \* File 1, Run 3, Scenario 1.  
 \* \* \* \* \*  
 M112 Warning:

Wintertime Reformulated Gasoline Rules Apply  
 \*\*\* I/M credits for Tech1&2 vehicles were read from the following external  
 data file: TECH12.D

M 48 Warning:  
 there are no sales for vehicle class HDGV8b

LEV phase-in data read from file NLEVNE.D

Calendar Year: 2015  
 Month: Jan.  
 Altitude: Low  
 Minimum Temperature: 18.0 (F)  
 Maximum Temperature: 44.0 (F)  
 Minimum Rel. Hum.: 39.0 (%)  
 Maximum Rel. Hum.: 87.0 (%)  
 Fuel Sulfur Content: 90. ppm

Exhaust I/M Program: Yes  
 Evap I/M Program: Yes  
 ATP Program: Yes  
 Reformulated Gas: Yes

Vehicle Type:	LDGV	LDGT12	LDGT34	LDGT (All)	HDGV	LDDV	LDDT	HDDV	MC	All Veh
GVWR:	<6000	>6000	>6000							
VMT Distribution:	0.3115	0.4909	0.1673		0.0079	0.0004	0.0025	0.0186	0.0009	1.0000

Composite Emission Factors (g/ml):

Composite VOC :	1.018	0.918	1.343	1.026	2.796	0.741	0.830	1.046	5.38	1.041
Composite CO :	18.95	21.11	19.81	20.78	32.07	2.369	1.586	6.398	28.26	19.984
Composite NOX :	1.024	1.297	1.735	1.408	4.001	1.260	1.256	11.638	1.81	1.500

\*\*\*\*\*New Haven Ramp \*\*\*\*\*  
 \* MOBILE6.2.01 (31-Oct-2002) \*  
 \* Input file: MDSX2015.IN (file 1, run 4). \*  
 \*\*\*\*\*

\* Reading 94+ LEV IMPLEMENTATION SCHEDULE from the following external  
 data file: NLEVNE.D

M616 Comment: User has supplied post-1999 sulfur levels.  
 M603 Comment: User has disabled the calculation of REFUELING emissions.

\* Reading Registration Distributions from the following external  
 data file: CTREG02.D

\* Reading I/M program description records from the following external  
 data file: CTIM05.D

\*CT I/M PROGRAMS for all years 2015 and later (modified Jun 05 PMB/AG to reflect DMV info that 8,501-10,000 lb get TSI & GC (no OBD)





**Attachment B**  
**CALQVIEW2 Model Input and Output Files**

2015AM\_Sargent-I95\_NoBuild\_input

' Sargent @ I-95 2015 AM No Build', 60 , 175 , 0 , 0 , 7 , 0.3048 , 1 , 1  
' SB W Corner', 190 , 217.5 , 6  
' SB N Mi dblock', 190 , 317.5 , 6  
' SB S Mi dblock', 190 , 117.5 , 6  
' SE Corner', 255 , 187 , 6  
' NE Corner', 255 , 225 , 6  
' NB N Mi dblock', 255 , 317.5 , 6  
' NB S Mi dblock', 255 , 117.5 , 6  
' Sargent @ I-95 2015 AM No Build', 6 , 1 , 1 , 'CO'  
1  
' I-95 OnRamp', 'AG', 223 , 205.5 , 444 , 205.5 , 1 , 51.5 , 0 , 24  
2  
' Sargent NB TR', 'AG', 234.5 , 0 , 234.5 , 193.5 , 0 , 24 , 2  
76 , 62 , 4 , 290 , 128.66 , 3447 , 2 , 4  
1  
' Sargent NB', 'AG', 234.5 , 217.5 , 234.5 , 445.5 , 290 , 51.5 , 0 , 24  
2  
' Sargent SB L', 'AG', 216.5 , 445.5 , 216.5 , 217.5 , 0 , 12 , 1  
76 , 1 , 4 , 510 , 128.66 , 844 , 2 , 3  
2  
' Sargent SB T', 'AG', 205 , 445 , 205 , 217.5 , 0 , 12 , 1  
76 , 38 , 4 , 380 , 128.66 , 1863 , 2 , 3  
1  
' Sargent SB', 'AG', 211 , 217.5 , 211 , 0 , 890 , 51.5 , 0 , 24  
1 , 0 , 4 , 1000 , 4.3 , 'Y', 10 , 0 , 36

2015PM\_Sargent-I95\_NoBuild\_input

' Sargent @ I-95 2015 PM No Build', 60 , 175 , 0 , 0 , 7 , 0.3048 , 1 , 1  
 ' SB W Corner', 190 , 217.5 , 6  
 ' SB N Mi dblock', 190 , 317.5 , 6  
 ' SB S Mi dblock', 190 , 117.5 , 6  
 ' SE Corner', 255 , 187 , 6  
 ' NE Corner', 255 , 225 , 6  
 ' NB N Mi dblock', 255 , 317.5 , 6  
 ' NB S Mi dblock', 255 , 117.5 , 6  
 ' Sargent @ I-95 2015 PM No Build', 6 , 1 , 1 , 'CO'  
 1  
 ' I-95 OnRamp', 'AG', 223 , 205.5 , 444 , 205.5 , 1 , 51.5 , 0 , 24  
 2  
 ' Sargent NB TR', 'AG', 234.5 , 0 , 234.5 , 193.5 , 0 , 24 , 2  
 76 , 62 , 4 , 730 , 128.66 , 3394 , 2 , 4  
 1  
 ' Sargent NB', 'AG', 234.5 , 217.5 , 234.5 , 445.5 , 730 , 51.5 , 0 , 24  
 2  
 ' Sargent SB L', 'AG', 216.5 , 445.5 , 216.5 , 217.5 , 0 , 12 , 1  
 76 , 1 , 4 , 1090 , 128.66 , 324 , 2 , 3  
 2  
 ' Sargent SB T', 'AG', 205 , 445 , 205 , 217.5 , 0 , 12 , 1  
 76 , 38 , 4 , 480 , 128.66 , 1863 , 2 , 3  
 1  
 ' Sargent SB', 'AG', 211 , 217.5 , 211 , 0 , 1570 , 51.5 , 0 , 24  
 1 , 0 , 4 , 1000 , 4.3 , 'Y', 10 , 0 , 36

2015AM\_Sargent-I95\_Build\_input

' Sargent @ I-95 2015 AM Build', 60 , 175 , 0 , 0 , 7 , 0.3048 , 1 , 1  
' SB W Corner', 190 , 217.5 , 6  
' SB N Mi dblock', 190 , 317.5 , 6  
' SB S Mi dblock', 190 , 117.5 , 6  
' SE Corner', 255 , 187 , 6  
' NE Corner', 255 , 225 , 6  
' NB N Mi dblock', 255 , 317.5 , 6  
' NB S Mi dblock', 255 , 117.5 , 6  
' Sargent @ I-95 2015 AM Build', 6 , 1 , 1 , 'CO'  
1  
' I-95 OnRamp', 'AG', 223 , 205.5 , 444 , 205.5 , 1 , 51.5 , 0 , 24  
2  
' Sargent NB TR', 'AG', 234.5 , 0 , 234.5 , 193.5 , 0 , 24 , 2  
76 , 62 , 4 , 307 , 128.66 , 3422 , 2 , 4  
1  
' Sargent NB', 'AG', 234.5 , 217.5 , 234.5 , 445.5 , 307 , 51.5 , 0 , 24  
2  
' Sargent SB L', 'AG', 216.5 , 445.5 , 216.5 , 217.5 , 0 , 12 , 1  
76 , 1 , 4 , 568 , 128.66 , 795 , 2 , 3  
2  
' Sargent SB T', 'AG', 205 , 445 , 205 , 217.5 , 0 , 12 , 1  
76 , 38 , 4 , 380 , 128.66 , 1863 , 2 , 3  
1  
' Sargent SB', 'AG', 211 , 217.5 , 211 , 0 , 948 , 51.5 , 0 , 24  
1 , 0 , 4 , 1000 , 4.3 , 'Y', 10 , 0 , 36

2015PM\_Sargent-I95\_Build\_input

' Sargent @ I-95 2015 PM Build', 60 , 175 , 0 , 0 , 7 , 0.3048 , 1 , 1  
' SB W Corner', 190 , 217.5 , 6  
' SB N Mi dblock', 190 , 317.5 , 6  
' SB S Mi dblock', 190 , 117.5 , 6  
' SE Corner', 255 , 187 , 6  
' NE Corner', 255 , 225 , 6  
' NB N Mi dblock', 255 , 317.5 , 6  
' NB S Mi dblock', 255 , 117.5 , 6  
' Sargent @ I-95 2015 PM Build', 6 , 1 , 1 , 'CO'  
1  
' I-95 OnRamp', 'AG', 223 , 205.5 , 444 , 205.5 , 1 , 51.5 , 0 , 24  
2  
' Sargent NB TR', 'AG', 234.5 , 0 , 234.5 , 193.5 , 0 , 24 , 2  
86 , 63 , 4 , 739 , 128.66 , 3391 , 2 , 4  
1  
' Sargent NB', 'AG', 234.5 , 217.5 , 234.5 , 445.5 , 739 , 51.5 , 0 , 24  
2  
' Sargent SB L', 'AG', 216.5 , 445.5 , 216.5 , 217.5 , 0 , 12 , 1  
86 , 1 , 4 , 1126 , 128.66 , 324 , 2 , 3  
2  
' Sargent SB T', 'AG', 205 , 445 , 205 , 217.5 , 0 , 12 , 1  
86 , 25 , 4 , 480 , 128.66 , 1863 , 2 , 3  
1  
' Sargent SB', 'AG', 211 , 217.5 , 211 , 0 , 1606 , 51.5 , 0 , 24  
1 , 0 , 4 , 1000 , 4.3 , 'Y', 10 , 0 , 36



**CALQVIEW2 2015 AM No-Build Peak Output File**



JOB: Sargent @ I-95 2015 AM No Bui l d

RUN: Sargent @ I-95 2015 AM No Bui l d

DATE : 8/30/ 7  
 TIME : 11: 17: 47

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = .0 CM/S      VD = .0 CM/S      ZO = 175. CM      MIXH = 1000. M      AMB = 4.3 PPM  
 U = 1.0 M/S      CLAS = 4 (D)      ATIM = 60. MINUTES

LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	LENGTH (FT)	BRG TYPE (DEG)	VPH	EF (G/MI)	H (FT)	W (FT)	V/C QUEUE (VEH)
1. I-95 OnRamp	223.0	205.5	444.0	205.5	221.	90.	AG 1.	51.5	.0	24.0	.40
2. Sargent NB TR	234.5	.0	234.5	49.2	49.	360.	AG 563.	100.0	.0	24.0	2.5
3. Sargent NB L	234.5	217.5	234.5	445.5	228.	360.	AG 290.	51.5	.0	24.0	.67
4. Sargent SB L	216.5	445.5	216.5	439.3	6.	180.	AG 5.	100.0	.0	12.0	.48
5. Sargent SB T	205.0	445.0	205.0	366.0	79.	180.	AG 173.	100.0	.0	12.0	.48
6. Sargent SB	211.0	217.5	211.0	.0	217.	180.	AG 890.	51.5	.0	24.0	.48

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. Sargent NB TR	76	62	4.0	290	3447	128.66	2	4
4. Sargent SB L	76	1	4.0	510	844	128.66	2	3
5. Sargent SB T	76	38	4.0	380	1863	128.66	2	3

RECEPTOR LOCATIONS

RECEPTOR	X	Y	Z
1. SB W Corner	190.0	217.5	6.0
2. SB N Mi dblock	190.0	317.5	6.0
3. SB S Mi dblock	190.0	117.5	6.0
4. SE Corner	255.0	187.0	6.0
5. NE Corner	255.0	225.0	6.0
6. NB N Mi dblock	255.0	317.5	6.0
7. NB S Mi dblock	255.0	117.5	6.0

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE (DEGR)	WIND ANGLE RANGE (DEGR)	* CONCENTRATION (PPM)	REC1	REC2	REC3	REC4	REC5	REC6	REC7
0.		4.5	4.5	5.0	4.7	4.6	4.6	4.6	4.6
10.		4.6	4.6	5.6	4.5	4.5	4.4	4.4	4.4
20.		4.6	4.7	6.0	4.4	4.4	4.3	4.3	4.3
30.		4.6	4.7	6.0	4.3	4.3	4.3	4.3	4.3
40.		4.6	4.7	6.0	4.3	4.3	4.3	4.3	4.3
50.		4.6	4.6	5.8	4.3	4.3	4.3	4.3	4.3
60.		4.7	4.6	5.7	4.3	4.3	4.3	4.3	4.3
70.		4.7	4.6	5.6	4.3	4.3	4.3	4.3	4.3
80.		4.9	4.6	5.6	4.3	4.3	4.3	4.3	4.3
90.		5.1	4.6	5.6	4.3	4.3	4.3	4.3	4.3
100.		5.3	4.6	5.6	4.3	4.3	4.3	4.3	4.3
110.		5.4	4.6	5.6	4.3	4.3	4.3	4.3	4.3
120.		5.6	4.6	5.7	4.3	4.3	4.3	4.3	4.3
130.		5.7	4.6	6.0	4.3	4.3	4.3	4.3	4.3
140.		5.9	4.7	6.2	4.3	4.3	4.3	4.3	4.3
150.		6.2	4.7	6.4	4.3	4.3	4.3	4.3	4.3
160.		6.3	5.0	6.3	4.3	4.3	4.3	4.3	4.4
170.		6.1	5.2	5.8	4.5	4.5	4.6	4.5	4.5
180.		5.4	5.0	5.1	4.8	4.8	5.0	4.8	4.8
190.		4.8	4.6	4.6	5.1	5.2	5.4	5.1	5.1
200.		4.5	4.4	4.4	5.4	5.3	5.4	5.3	5.3
210.		4.3	4.3	4.3	5.4	5.3	5.2	5.4	5.3
220.		4.3	4.3	4.3	5.3	5.4	5.0	5.3	5.3
230.		4.3	4.3	4.3	5.2	5.2	4.8	5.2	5.2
240.		4.3	4.3	4.3	5.2	5.2	4.8	5.2	5.2
250.		4.3	4.3	4.3	5.2	5.1	4.7	5.2	5.2
260.		4.3	4.3	4.3	5.2	5.0	4.7	5.2	5.2
270.		4.3	4.3	4.3	5.2	5.1	4.7	5.2	5.2
280.		4.3	4.3	4.3	5.1	4.8	4.7	5.2	5.2
290.		4.3	4.3	4.3	5.0	4.7	4.7	5.2	5.2
300.		4.3	4.3	4.3	4.9	4.8	4.8	5.2	5.2
310.		4.3	4.3	4.3	4.8	4.8	4.9	5.2	5.2
320.		4.3	4.3	4.3	4.7	4.8	5.0	5.2	5.2
330.		4.3	4.3	4.3	4.7	4.9	5.1	5.1	5.1
340.		4.3	4.3	4.4	4.8	5.0	4.9	4.9	4.9
350.		4.3	4.4	4.6	4.9	4.9	4.8	4.7	4.7
360.		4.5	4.5	5.0	4.6	4.7	4.6	4.6	4.6
MAX		6.3	5.2	6.4	5.4	5.4	5.4	5.4	5.4
DEGR.		160	170	150	200	220	190	210	210

THE HIGHEST CONCENTRATION OF 6.40 PPM OCCURRED AT RECEPTOR REC3 .

RECEPTOR - LINK MATRIX FOR THE ANGLE PRODUCING  
THE MAXIMUM CONCENTRATION FOR EACH RECEPTOR

LINK #	CO/LINK (PPM)		ANGLE (DEGREES)						
	REC1 160	REC2 170	REC3 150	REC4 200	REC5 220	REC6 190	REC7 210		
1	.0	.0	.0	.0	.0	.0	.0	.0	
2	.2	.1	.4	.2	.0	.1	.3	.0	
3	.0	.1	.0	.0	.1	.4	.0	.0	
4	.0	.0	.0	.0	.0	.0	.0	.0	
5	.0	.0	.0	.0	.0	.0	.0	.0	
6	1.8	.7	1.7	.9	1.0	.6	.8	.0	



**CALQVIEW2 2015 PM No-Build Peak Output File**

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0 Dated 95221

JOB: Sargent @ I-95 2015 PM No Bui Id

RUN: Sargent @ I-95 2015 PM No Bui Id

DATE : 8/30/ 7  
 TIME : 11:31: 8

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = .0 CM/S      VD = .0 CM/S      ZO = 175. CM  
 U = 1.0 M/S      CLAS = 4 (D)      ATIM = 60. MINUTES      MIXH = 1000. M      AMB = 4.3 PPM

LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	LENGTH (FT)	BRG TYPE (DEG)	VPH	EF (G/MI)	H (FT)	W (FT)	V/C QUEUE (VEH)
1. I-95 OnRamp	223.0	205.5	444.0	205.5	221.	90.	AG 1.	51.5	.0	24.0	
2. Sargent NB TR	234.5	.0	234.5	262.4	262.	360.	AG 563.	100.0	.0	24.0	13.3
3. Sargent NB L	234.5	217.5	234.5	445.5	228.	360.	AG 730.	51.5	.0	24.0	
4. Sargent SB L	216.5	445.5	216.5	-7660.4	8106.	180.	AG 5.	100.0	.0	12.0	411.8
5. Sargent SB T	205.0	445.0	205.0	345.3	100.	180.	AG 173.	100.0	.0	12.0	5.1
6. Sargent SB	211.0	217.5	211.0	.0	217.	180.	AG 1570.	51.5	.0	24.0	

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. Sargent NB TR	76	62	4.0	730	3394	128.66	2	4
4. Sargent SB L	76	1	4.0	1090	324	128.66	2	3
5. Sargent SB T	76	38	4.0	480	1863	128.66	2	3

RECEPTOR LOCATIONS

RECEPTOR	X	Y	Z	COORDINATES (FT)
1. SB W Corner	190.0	217.5	6.0	6.0
2. SB N Mi dblock	190.0	317.5	6.0	6.0
3. SB S Mi dblock	190.0	117.5	6.0	6.0
4. SE Corner	255.0	187.0	6.0	6.0
5. NE Corner	255.0	225.0	6.0	6.0
6. NB N Mi dblock	255.0	317.5	6.0	6.0
7. NB S Mi dblock	255.0	117.5	6.0	6.0

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE (DEGR)	WIND ANGLE RANGE (DEGR)	* CONCENTRATION (PPM)	REC1	REC2	REC3	REC4	REC5	REC6	REC7
0.			4.7	4.7	6.0	5.8	5.5	5.0	6.0
10.			4.9	5.0	7.3	4.9	4.8	4.6	5.1
20.			5.3	5.2	8.3	4.5	4.4	4.4	4.5
30.			5.4	5.3	8.6	4.3	4.3	4.3	4.3
40.			5.6	5.3	8.4	4.3	4.3	4.3	4.3
50.			5.9	5.2	8.0	4.3	4.3	4.3	4.3
60.			6.1	5.0	7.8	4.3	4.3	4.3	4.3
70.			6.3	5.0	7.8	4.3	4.3	4.3	4.3
80.			6.6	5.0	7.7	4.3	4.3	4.3	4.3
90.			7.0	5.0	7.7	4.3	4.3	4.3	4.3
100.			7.2	5.0	7.7	4.3	4.3	4.3	4.3
110.			7.5	5.0	7.8	4.3	4.3	4.3	4.3
120.			7.7	5.1	7.9	4.3	4.3	4.3	4.3
130.			7.9	5.3	8.0	4.3	4.3	4.3	4.3
140.			8.4	5.7	8.2	4.3	4.3	4.3	4.3
150.			8.7	6.1	8.2	4.3	4.3	4.3	4.3
160.			8.6	6.6	7.8	4.5	4.5	4.6	4.4
170.			7.9	6.7	6.9	5.0	6.2	6.6	5.4
180.			6.5	5.9	5.7	6.0	6.2	7.5	7.7
190.			5.3	5.1	4.8	7.2	7.5	7.7	6.5
200.			4.6	4.5	4.5	8.0	8.3	8.4	7.4
210.			4.3	4.3	4.3	8.3	8.4	6.9	7.9
220.			4.3	4.3	4.3	8.1	8.2	6.2	7.9
230.			4.3	4.3	4.3	7.8	7.9	5.7	7.7
240.			4.3	4.3	4.3	7.6	7.8	5.5	7.6
250.			4.3	4.3	4.3	7.5	7.7	5.4	7.5
260.			4.3	4.3	4.3	7.5	7.5	5.4	7.5
270.			4.3	4.3	4.3	7.5	7.3	5.4	7.6
280.			4.3	4.3	4.3	7.4	7.1	5.4	7.5
290.			4.3	4.3	4.3	7.2	7.1	5.5	7.6
300.			4.3	4.3	4.3	7.1	7.2	5.6	7.6
310.			4.3	4.3	4.3	7.1	7.2	5.7	7.7
320.			4.3	4.3	4.3	7.0	7.3	5.8	7.9
330.			4.3	4.3	4.3	7.1	7.2	5.9	7.9
340.			4.3	4.3	4.4	7.2	6.8	5.9	7.7
350.			4.5	4.4	4.9	6.8	6.3	5.5	7.0
360.			4.7	4.7	6.0	5.8	5.5	5.0	6.0
MAX			8.7	6.7	8.6	8.3	8.4	7.7	7.9
DEGR.			150	170	30	210	210	190	210

THE HIGHEST CONCENTRATION OF 8.70 PPM OCCURRED AT RECEPTOR REC1

RECEPTOR - LINK MATRIX FOR THE ANGLE PRODUCING  
THE MAXIMUM CONCENTRATION FOR EACH RECEPTOR

LINK #	CO/LINK (PPM)			ANGLE (DEGREES)						
	REC1 150	REC2 170	REC3 30	REC4 210	REC5 210	REC6 190	REC7 210	REC6 190	REC7 210	
1	.0	.0	.0	.0	.0	.0	.0	.0	.0	
2	1.3	1.0	1.1	2.2	2.2	1.4	2.1	1.4	2.1	
3	.0	.2	.3	.0	.1	1.0	.0	1.0	.0	
4	.0	.0	.0	.0	.0	.0	.0	.0	.0	
5	.0	.0	.0	.0	.0	.0	.0	.0	.0	
6	3.1	1.2	2.9	1.8	1.8	1.0	1.5	1.0	1.5	

**CALQVIEW2 2015 AM Build Peak Output File**



CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0 Dated 95221

JOB: Sargent @ I-95 2015 AM Build

RUN: Sargent @ I-95 2015 AM Build

DATE : 8/30/7  
TIME : 11:37:41

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = .0 CM/S      VD = .0 CM/S      ZO = 175. CM      MIXH = 1000. M      AMB = 4.3 PPM  
U = 1.0 M/S      CLAS = 4 (D)      ATIM = 60. MINUTES

LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	LENGTH (FT)	BRG TYPE (DEG)	VPH	EF (G/MI)	H (FT)	W (FT)	V/C QUEUE (VEH)
1. I-95 OnRamp	223.0	205.5	444.0	205.5	221.	90. AG	1.	51.5	.0	24.0	
2. Sargent NB TR	234.5	.0	234.5	51.9	52.	360. AG	563.	100.0	.0	24.0	.43
3. Sargent NB L	234.5	217.5	234.5	445.5	228.	360. AG	307.	51.5	.0	24.0	
4. Sargent SB L	216.5	445.5	216.5	429.9	16.	180. AG	5.	100.0	.0	12.0	.79
5. Sargent SB T	205.0	445.0	205.0	366.0	79.	180. AG	173.	100.0	.0	12.0	.48
6. Sargent SB	211.0	217.5	211.0	.0	217.	180. AG	948.	51.5	.0	24.0	

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. Sargent NB TR	76	62	4.0	307	3422	128.66	2	4
4. Sargent SB L	76	1	4.0	568	795	128.66	2	3
5. Sargent SB T	76	38	4.0	380	1863	128.66	2	3

RECEPTOR LOCATIONS

RECEPTOR	X	Y	Z
1. SB W Corner	190.0	217.5	6.0
2. SB N MI dblock	190.0	317.5	6.0
3. SB S MI dblock	190.0	117.5	6.0
4. SE Corner	255.0	187.0	6.0
5. NE Corner	255.0	225.0	6.0
6. NB N MI dblock	255.0	317.5	6.0
7. NB S MI dblock	255.0	117.5	6.0

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE (DEGR)	WIND ANGLE RANGE (DEGR)	* CONCENTRATION (PPM)	REC1	REC2	REC3	REC4	REC5	REC6	REC7
0.		4.5	4.5	5.1	4.7	4.7	4.6	4.6	4.6
10.		4.6	4.6	5.7	4.5	4.5	4.4	4.4	4.4
20.		4.6	4.7	6.1	4.4	4.4	4.3	4.3	4.3
30.		4.7	4.7	6.1	4.3	4.3	4.3	4.3	4.3
40.		4.6	4.7	6.1	4.3	4.3	4.3	4.3	4.3
50.		4.6	4.6	5.9	4.3	4.3	4.3	4.3	4.3
60.		4.7	4.6	5.8	4.3	4.3	4.3	4.3	4.3
70.		4.8	4.6	5.7	4.3	4.3	4.3	4.3	4.3
80.		4.9	4.6	5.7	4.3	4.3	4.3	4.3	4.3
90.		5.2	4.6	5.7	4.3	4.3	4.3	4.3	4.3
100.		5.4	4.6	5.7	4.3	4.3	4.3	4.3	4.3
110.		5.5	4.6	5.7	4.3	4.3	4.3	4.3	4.3
120.		5.7	4.6	5.9	4.3	4.3	4.3	4.3	4.3
130.		5.8	4.6	6.1	4.3	4.3	4.3	4.3	4.3
140.		6.0	4.7	6.3	4.3	4.3	4.3	4.3	4.3
150.		6.3	4.8	6.5	4.3	4.3	4.3	4.3	4.3
160.		6.4	5.1	6.4	4.3	4.3	4.3	4.3	4.4
170.		6.2	5.2	5.9	4.5	4.5	4.6	4.5	4.5
180.		5.5	5.0	5.2	4.8	4.9	5.0	4.8	4.8
190.		4.8	4.7	4.6	5.1	5.2	5.4	5.4	5.1
200.		4.5	4.4	4.4	5.4	5.4	5.4	5.4	5.4
210.		4.3	4.3	4.3	5.5	5.4	5.3	5.5	5.5
220.		4.3	4.3	4.3	5.4	5.4	5.1	5.4	5.4
230.		4.3	4.3	4.3	5.3	5.3	4.8	5.3	5.3
240.		4.3	4.3	4.3	5.3	5.3	4.8	5.2	5.2
250.		4.3	4.3	4.3	5.2	5.2	4.8	5.2	5.2
260.		4.3	4.3	4.3	5.3	5.3	5.1	4.8	5.2
270.		4.3	4.3	4.3	5.2	5.2	5.0	4.8	5.2
280.		4.3	4.3	4.3	5.2	5.2	4.8	4.8	5.2
290.		4.3	4.3	4.3	5.1	4.8	4.8	4.8	5.2
300.		4.3	4.3	4.3	4.9	4.8	4.8	4.8	5.2
310.		4.3	4.3	4.3	4.8	4.8	4.9	4.9	5.3
320.		4.3	4.3	4.3	4.7	4.9	5.1	5.1	5.2
330.		4.3	4.3	4.3	4.7	4.9	5.1	5.1	5.2
340.		4.3	4.3	4.4	4.9	5.0	5.0	5.0	5.0
350.		4.3	4.4	4.6	4.9	5.0	4.9	4.9	4.8
360.		4.5	4.5	5.1	4.7	4.7	4.6	4.6	4.6
MAX		6.4	5.2	6.5	5.5	5.5	5.4	5.5	5.5
DEGR.		160	170	150	210	220	190	210	210

THE HIGHEST CONCENTRATION OF 6.50 PPM OCCURRED AT RECEPTOR REC3 .

RECEPTOR - LINK MATRIX FOR THE ANGLE PRODUCING  
THE MAXIMUM CONCENTRATION FOR EACH RECEPTOR

LINK #	CO/LINK (PPM)		ANGLE (DEGREES)						
	REC1	REC2	REC3	REC4	REC5	REC6	REC7		
	160	170	150	210	220	190	210		
1	.0	.0	.0	.0	.0	.0	.0		
2	.2	.1	.4	.1	.0	.1	.3		
3	.0	.1	.0	.0	.1	.4	.0		
4	.0	.0	.0	.0	.0	.0	.0		
5	.0	.0	.0	.0	.0	.0	.0		
6	1.9	.7	1.8	1.1	1.1	.6	.9		



**CALQVIEW2 2015 PM Build Peak Output File**

CAL3QHC: LINE SOURCE DISPERSION MODEL - VERSION 2.0 Dated 95221

JOB: Sargent @ I-95 2015 PM Build

RUN: Sargent @ I-95 2015 PM Build

DATE : 8/30/7  
TIME : 11:40:54

The MODE flag has been set to C for calculating CO averages.

SITE & METEOROLOGICAL VARIABLES

VS = .0 CM/S      VD = .0 CM/S      ZO = 175. CM      MIXH = 1000. M      AMB = 4.3 PPM  
U = 1.0 M/S      CLAS = 4 (D)      ATIM = 60. MINUTES

LINK VARIABLES

LINK DESCRIPTION	X1	Y1	X2	Y2	LENGTH (FT)	BRG TYPE (DEG)	VPH	EF (G/MI)	H (FT)	W (FT)	V/C QUEUE (VEH)
1. I-95 OnRamp	223.0	205.5	444.0	205.5	221.	90.	AG 1.	51.5	.0	24.0	
2. Sargent NB TR	234.5	.0	234.5	127.1	127.	360.	AG 506.	100.0	.0	24.0	.55
3. Sargent NB L	234.5	217.5	234.5	445.5	228.	360.	AG 739.	51.5	.0	24.0	6.5
4. Sargent SB L	216.5	445.5	216.5	-7992.8	8438.	180.	AG 4.	100.0	.0	12.0	3.79
5. Sargent SB T	205.0	445.0	205.0	379.4	66.	180.	AG 100.	100.0	.0	12.0	.40
6. Sargent SB	211.0	217.5	211.0	.0	217.	180.	AG 1606.	51.5	.0	24.0	3.3

ADDITIONAL QUEUE LINK PARAMETERS

LINK DESCRIPTION	CYCLE LENGTH (SEC)	RED TIME (SEC)	CLEARANCE LOST TIME (SEC)	APPROACH VOL (VPH)	SATURATION FLOW RATE (VPH)	IDLE EM FAC (gm/hr)	SIGNAL TYPE	ARRIVAL RATE
2. Sargent NB TR	86	63	4.0	739	3391	128.66	2	4
4. Sargent SB L	86	1	4.0	1126	324	128.66	2	3
5. Sargent SB T	86	25	4.0	480	1863	128.66	2	3

RECEPTOR LOCATIONS

RECEPTOR	X	Y	Z
1. SB W Corner	190.0	217.5	6.0
2. SB N Mi dblock	190.0	317.5	6.0
3. SB S Mi dblock	190.0	117.5	6.0
4. SE Corner	255.0	187.0	6.0
5. NE Corner	255.0	225.0	6.0
6. NB N Mi dblock	255.0	317.5	6.0
7. NB S Mi dblock	255.0	117.5	6.0

MODEL RESULTS

REMARKS : In search of the angle corresponding to the maximum concentration, only the first angle, of the angles with same maximum concentrations, is indicated as maximum.

WIND ANGLE (DEGR)	WIND ANGLE RANGE (DEGR)	* CONCENTRATION (PPM)	REC1	REC2	REC3	REC4	REC5	REC6	REC7
0.			4.6	4.5	5.7	5.2	5.2	5.0	4.9
10.			4.9	4.7	6.8	4.7	4.7	4.6	4.6
20.			5.1	4.9	7.5	4.4	4.4	4.4	4.4
30.			5.2	5.0	7.5	4.3	4.3	4.3	4.3
40.			5.1	5.1	7.3	4.3	4.3	4.3	4.3
50.			5.2	5.1	6.9	4.3	4.3	4.3	4.3
60.			5.2	5.0	6.9	4.3	4.3	4.3	4.3
70.			5.3	5.0	7.0	4.3	4.3	4.3	4.3
80.			5.5	5.0	7.2	4.3	4.3	4.3	4.3
90.			5.9	5.0	7.4	4.3	4.3	4.3	4.3
100.			6.1	5.0	7.6	4.3	4.3	4.3	4.3
110.			6.5	5.0	7.6	4.3	4.3	4.3	4.3
120.			6.7	5.0	7.8	4.3	4.3	4.3	4.3
130.			7.0	5.0	7.9	4.3	4.3	4.3	4.3
140.			7.4	5.1	8.2	4.3	4.3	4.3	4.3
150.			7.9	5.4	8.2	4.3	4.3	4.3	4.3
160.			8.1	5.7	7.9	4.4	4.4	4.5	4.4
170.			7.7	6.0	6.8	4.8	4.8	5.0	4.7
180.			6.5	5.7	5.7	5.5	5.4	5.8	5.3
190.			5.3	5.0	4.8	6.2	6.1	6.7	6.3
200.			4.6	4.5	4.5	6.6	6.4	6.7	7.2
210.			4.3	4.3	4.3	6.5	6.5	6.3	7.7
220.			4.3	4.3	4.3	6.3	6.3	5.9	7.8
230.			4.3	4.3	4.3	6.1	6.1	5.6	7.6
240.			4.3	4.3	4.3	5.9	6.1	5.5	7.5
250.			4.3	4.3	4.3	5.9	6.0	5.4	7.4
260.			4.3	4.3	4.3	5.9	5.9	5.4	7.3
270.			4.3	4.3	4.3	5.9	5.8	5.4	7.3
280.			4.3	4.3	4.3	5.8	5.5	5.4	7.1
290.			4.3	4.3	4.3	5.6	5.5	5.4	6.8
300.			4.3	4.3	4.3	5.4	5.5	5.5	6.5
310.			4.3	4.3	4.3	5.3	5.5	5.5	6.3
320.			4.3	4.3	4.3	5.2	5.7	5.8	6.2
330.			4.3	4.3	4.3	5.2	5.8	5.8	5.9
340.			4.3	4.3	4.4	5.4	5.9	5.8	5.7
350.			4.4	4.3	4.9	5.5	5.7	5.4	5.3
360.			4.6	4.5	5.7	5.2	5.2	5.0	4.9
MAX			8.1	6.0	8.2	6.6	6.5	6.7	7.8
DEGR.			160	170	140	200	210	190	220

THE HIGHEST CONCENTRATION OF 8.20 PPM OCCURRED AT RECEPTOR REC3 .

RECEPTOR - LINK MATRIX FOR THE ANGLE PRODUCING  
THE MAXIMUM CONCENTRATION FOR EACH RECEPTOR

LINK #	CO/LINK (PPM)		ANGLE (DEGREES)						
	REC1	REC2	REC3	REC4	REC5	REC6	REC7		
	160	170	140	200	210	190	220		
1	.0	.0	.0	.0	.0	.0	.0		
2	.5	.3	1.0	.7	.2	.3	1.8		
3	.0	.2	.0	.0	.1	1.0	.0		
4	.0	.0	.0	.0	.0	.0	.0		
5	.0	.0	.0	.0	.0	.0	.0		
6	3.3	1.2	2.9	1.6	1.9	1.1	1.7		

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**APPENDIX G: CONNDOT POLICY ON SYSTEMATIC  
CONSIDERATION AND MANAGEMENT OF WORK ZONE  
IMPACTS**

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# CONNECTICUT DEPARTMENT OF TRANSPORTATION

## POLICY STATEMENT

POLICY NO. E&H.O.- 57  
August 10, 2007

SUBJECT: Policy on Systematic Consideration and Management of Work Zone Impacts

It is the policy of the Department to systematically consider and manage work zone impacts of significant projects.

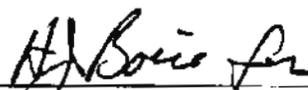
In establishing this Work Zone policy, the Department's objectives are to:

1. Provide a high level of safety for both workers and the public.
2. Minimize congestion and community impacts.
3. Provide both maintenance forces and contractors adequate access to the highway to efficiently conduct their work.

In order to meet these objectives, appropriate planning, design, construction, maintenance, and public awareness strategies shall be employed on all significant projects. For the purposes of this policy, a significant project is defined as:

A stationary highway construction or maintenance activity which causes sustained mobility impacts on I-84, I-91, I-95, I-291, I-384, or I-691 for more than three (3) days with either intermittent or continuous lane closures. In addition, any highway construction or maintenance activity that alone or in combination with other concurrent activities nearby, which is expected based on engineering judgment, to cause sustained mobility impacts that are considered greater than what is considered tolerable relative to typical traffic operations experienced in the area of the work zone, may be declared a significant project.

It is recognized that the Department's emergency operations may not always allow a systematic consideration of work zone impacts. In such situations, the objectives of this policy will be honored as much as practicable.

  
\_\_\_\_\_  
Ralph J. Carpenter  
COMMISSIONER

STATE OF CONNECTICUT  
DEPARTMENT OF TRANSPORTATION

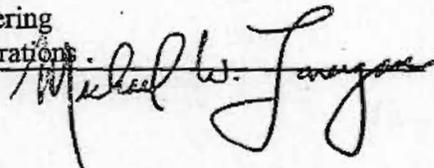
*subject* Work Zone Safety and Mobility Policy and  
Implementation Plan

*memorandum*

*date:* August 6, 2007

*To* Mr. Charles Barone  
Mr. James H. Norman  
Mr. Robert P. Mongillo  
Mr. Lewis Cannon

*from* Michael W. Lonergan  
Acting Bureau Chief  
Bureau of Engineering  
and Highway Operations



In September 2004, the Federal Highway Administration (FHWA) published updates to the Work Zone regulations contained in 23 CFR 630 Subpart J. The updated rule is referred to as the Work Zone Safety and Mobility Rule (Rule) and applies to all State and local governments that received Federal-aid highway funding. Transportation agencies are required to comply with the provisions of the Rule by October 12, 2007.

The Rule requires agencies to develop and implement an agency-level Work Zone Safety and Mobility policy to support systematic consideration and management of work zone impacts across all stages of project development. In order to develop this required policy, as well as prepare an associated implementation plan, a Rule Steering Committee was established by the Department. Members of this multi-disciplinary committee included representatives from the FHWA and Offices of Construction, Maintenance, Engineering, and Intermodal Planning.

The attached draft Department policy entitled "Policy on Systematic Consideration and Management of Work Zone Impacts" is in conformance with the Rule and by copy of this memorandum is being forwarded to Commissioner Carpenter's Office for approval. The policy defines which Department projects are subject to the Rule and allows an exception for unplanned emergency operations.

The attached implementation plan has been developed to provide guidance to your offices in complying with the Rule. The plan identifies several assignments and ongoing responsibilities for the units under your supervision which will be necessary for compliance. It should be noted that your Offices will need to develop more specific project and program level procedures to institutionalize the letter and spirit of the Rule. Your representatives to the Rule Steering Committee should be utilized as resources in this effort.

It has been determined that in Connecticut all "significant" projects, as defined by the policy, that begin their planning, preliminary engineering or preliminary design phase on or after October 1, 2007, or whose design completion date (DCD) is on or after October 1, 2008, shall be in accordance with the Rule. For those "significant" projects with a DCD during Federal Fiscal Year 2008 (October 1, 2007 to September 30, 2008), the FHWA, in coordination with the Department, will approve PS&E following confirmation that the appropriate TMP components have been incorporated in compliance with the Rule. Please take the steps necessary to ensure the Department's compliance with the Rule by these dates.

Attachment(s)

cc: Bradley Keazer (FHWA)  
Robert Ramirez (FHWA)

John F. Carey:jyk

cc: Comr. Carpenter – Dep. Comr. Boice – Dep. Comr. Curtis – Dep. Comr. Martin

David Crowther – Please process the attached Policy for Commissioner Carpenter's approval.

Arthur W. Gruhn – Michael W. Lonergan - Richard T. Jankovich

James H. Norman, Acting Engineering Administrator

Timothy Wilson

Carmine Trotta

Robert P. Mongillo-Charles A. Drda-Ronald Cormier-David A. Sawicki-John Carey (Maintenance)

Mark Rolfe

John F. Carey





# CONNECTICUT DEPARTMENT OF TRANSPORTATION

# POLICY STATEMENT

POLICY NO. E&HO

August 6, 2007

SUBJECT: Policy on Systematic Consideration and Management of Work Zone Impacts

It is the policy of the Department to systematically consider and manage work zone impacts of significant projects.

In establishing this Work Zone policy, the Department's objectives are:

1. Provide a high level of safety for both workers and the public.
2. Minimize congestion and community impacts.
3. To provide both maintenance forces and contractors adequate access to the highway to efficiently conduct their work.

In order to meet these objectives, appropriate planning, design, construction, maintenance and public awareness strategies shall be employed on all significant projects. For the purposes of this policy, a significant project is defined as:

A stationary highway construction or maintenance activity which causes sustained mobility impacts on I-84, I-91, I-95, I-691, I-291 or I-384 for more than 3 days with either intermittent or continuous lane closures. In addition, any highway construction or maintenance activity that alone or in combination with other concurrent activities nearby, which is expected based on engineering judgment, to cause sustained mobility impacts that are considered greater than what is considered tolerable relative to typical traffic operations experienced in the area of the work zone, may be declared a significant project.

It is recognized that the Department's emergency operations may not always allow a systematic consideration of work zone impacts. In such situations, the objectives of this policy will be honored as much as practicable.

## WORK ZONE SAFETY AND MOBILITY IMPLEMENTATION PLAN GUIDANCE

The Connecticut Department of Transportation (Department) shall establish and implement a program to improve safety and mobility within work zones for certain interstate and state roadway construction projects, in accordance with the Federal Highway Administration Work Zone Safety and Mobility Final Rule.

### COMPLIANCE

The Department, in compliance with the Federal Highway Administration Final Rule, has developed a Policy regarding Work Zone Safety and Mobility (WZS&M). Implementation of this policy is effective October 1, 2007. All State transportation planning documents (e.g. planning studies, Master Plans, Long Range Plans, Strategic Highway Safety Plans) that include certain interstate or state roads and are initiated on or following October 1, 2007, shall address WZS&M in accordance with the Final Rule and Department policy. In addition, WZS&M compliance shall be implemented for those interstate or state roadway transportation projects that have been designated as "significant" in accordance with this Policy and Implementation Plan, which have been in development prior to October 1, 2007, and that begin the preliminary engineering or preliminary design phase of development on or after October 1, 2007, or whose design completion date (DCD) is on or after October 1, 2008.

For those "significant" projects with a DCD during Federal Fiscal Year 2008 (October 1, 2007 to September 30, 2008), the FHWA, in coordination with the Department, will approve PS&E following confirmation that the appropriate TMP components have been incorporated in compliance with the WZS&M Final Rule.

The Department WZS&M Policy and Implementation Plan (and associated procedures) shall be reviewed every two years (or as needed) to determine the effectiveness of its application and consistency with FHWA direction.

### INTRODUCTION

On September 9, 2004, the Federal Highway Administration (FHWA) issued a final rule on Work Zone Safety and Mobility. This rule addresses the changing times of more traffic, more congestion, greater safety issues, and more work zones. The FHWA revised the regulation to facilitate comprehensive consideration of the broader safety and mobility impacts of work zones across all stages of project development, and the adoption of additional strategies that help manage these impacts during project implementation. The new FHWA provisions are intended to help State Departments of Transportation (DOTs) meet current and future work zone safety and mobility challenges, and serve the needs of the American people. DOTs must be in compliance with the final Rule by October 12, 2007. The key features of the Final Rule are as follows:

- A policy driven focus that will institutionalize work zone processes and procedures at the agency level, with specific language for application at the project level.
- A systems engineering approach that includes provisions to work zone considerations starting early in planning, and progressing through project design, implementation, and performance assessment.
- Emphasis on addressing the broader impacts of work zones to develop transportation management strategies that address traffic safety and control through the work zone, transportation operations, and public information and outreach.
- Emphasis on a partner driven approach, whereby transportation agencies and the FHWA will work together towards improving work zone safety and mobility.
- Overall flexibility, scalability, and adaptability of the provisions, so as to customize the application of the regulations according to the needs of individual agencies, and to meet the needs of the various types of highway projects.

Section 135 of Title 23 and Section 5304 of Title 49 of the United States Code (USC), as amended by the *Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users* (SAFETEA-LU) requires each State to carry out a transportation planning process that provides for consideration of projects and strategies that will increase the safety of the transportation system for motorized and non-motorized users. With respect to Work Zone Safety, SAFETEA-LU contains several provisions that address safety in highway construction work zones. They are as follows:

Work Zone Safety Grants – Under the Work Zone Safety Grants program, the U.S. Department of Transportation (USDOT) will make grants to nonprofit and not-for-profit organizations to provide training to prevent and reduce work zone injuries and fatalities. Such grants may be used for:

- construction worker training to prevent injuries and fatalities
- development of guidelines to prevent work zone injuries and fatalities
- training for State and local governments, transportation agencies, and other groups implementing these guidelines

Temporary Traffic Control Devices (TTC) - Projects may not be approved on Federal-aid highways or under the Federal Lands Highway program unless proper temporary traffic control devices to improve safety in work zones will be installed and maintained during construction, utility, and maintenance operations on the portion of the highway to be improved by such projects. Installation and maintenance of the devices must be in accordance with the Manual on Uniform Traffic Control Devices.

The Secretary of Transportation, after consultation with appropriate Federal and State officials, is to issue regulations establishing the conditions for the appropriate use of, and expenditure of funds for, uniformed law enforcement officer, positive protective measures between workers and motorized traffic, and installation and maintenance of temporary traffic control devices during construction, utility, and maintenance operations.

Worker Injury Prevention and Free Flow of Vehicular Traffic – By August 10, 2006, the Secretary of U.S. DOT must establish regulations requiring highway workers to wear high visibility garments.

National Work Zone Safety Information Clearinghouse - Under this program, the U.S. DOT will make grants to a national nonprofit foundation for the operation of the National Work Zone Information Clearinghouse to be used for assembling and disseminating, electronically or otherwise, information relating to the improvement of work zone safety.

Implementation of the Department policy on WZS&M involves a number of actions to address:

- Data collection and Reporting during project construction.
- Data retention.
- Data analysis.
- Early evaluation and documentation in the identification of "significant" proposed projects.
- Establishment of specific project scope and limits.
- Reassessment of "significant" project determinations at each phase of project development.
- Development of a TTC plan, Transportation Operations (TO) plan and Public Outreach (PO)/Public Information (PI) program components, as warranted.
- Application during project construction.
- Monitoring during project construction.
- Post-construction analysis of significant projects.

## BACKGROUND

WZS&M focuses on those projects that are determined to be "significant" as defined by Department policy (and consistent with FHWA guidelines). The scope and limits of all projects that are advanced to construction by the Department evolves as information becomes available and analysis is refined. In addressing WZS&M, it is essential that an initial determination regarding the project "significance" is made as early as possible and that there is an opportunity to reassess that determination at the various phases of project development and definition (i.e. planning, preliminary engineering, preliminary design, and final design).

The initial stage in the overall development and determination of a "significant project" as defined by the Department policy on WZS&M, is the conduct of a planning analysis to identify the transportation needs and deficiencies to be addressed for both the existing and future (20-year horizon) "No Build" conditions. Once such needs are identified, options are considered towards the development of a recommended action to modify the transportation system to address those needs. An implementation plan which may consist of both near-term (if any) and long-term recommendations is recommended. This is typically accomplished by a State/Federal (Federal Highway Administration) study team representing planning, maintenance, and engineering design disciplines, often in coordination with a stakeholder committee.

Recommendations documented at the planning phase are considered conceptual, possibly consisting of various transportation modes, and must be refined and more precisely defined as the recommended action(s) is further developed through the National Environmental Policy Act / Connecticut Environmental Policy Act (NEPA/CEPA) documentation, preliminary engineering, preliminary design and final design processes. A determination of a "significant project" must be reassessed for every project at each of these stages of project development.

## **IMPLEMENTATION**

### **Training:**

The Final Rule specifies that agencies require appropriate training and periodic updates, for personnel involved in the development, design, implementation operations, inspection and enforcement of work zone related transportation management and traffic control. These include transportation planners, design engineers, traffic and safety engineers, temporary traffic control designers and program managers, regional construction managers, construction project staff, maintenance staff, and contractor and utility staff. This may include executive level decision-makers, policy makers, senior managers, information officers, and law enforcement and incident responders.

The Department and Industry Organizations will provide the opportunity for training through a number of initiatives. The Department, through the Training Coordinator and in coordination with the FHWA, will seek to sponsor available related courses for Department personnel. In addition, annual training provided for Department Construction Inspectors will include a discussion addressing WZS&M.

### **Data Collection / Reporting Procedures:**

The Department's Offices of Traffic Engineering, Maintenance, Construction and Inventory and Forecasting will establish procedures for the collection, reporting and retention of WZS&M data, for "significant" projects. Such information may include but may not be limited to:

- Incident type and duration.
- Residual traffic queue and duration.
- Police reporting records.

Data shall be collected and retained for all projects determined to be "significant", within the work zone limits, defined as the display point of the approach "Series 16" limited liability sign, through to the exiting "End Construction" sign.

### **Data Retention / Analysis:**

The Final Rule requires States to use field observations, available Work Zone Crash data, and operational information to manage Work Zone impacts for specific significant projects during construction. In addition, States are required to continually pursue improvement of Work Zone Safety and mobility by analyzing Work Zone Crash and operational data from multiple significant projects to improve State processes and procedures.

The satisfaction of these two requirements will require updates to the Department's computerized data retention system that are in progress but not yet

available. While the Department's roadway characteristics file has been revised to a relational data base, the Department's accident record, traffic volume, and pre-design project status/location files currently reside on a legacy main frame computer system and are not readily linked. Such linkage is necessary to identify construction project limits and reflect accident, traffic volume, and roadway inventory records. The Department is presently pursuing improvements to these mainframe files which will move these records to relational databases similar to the roadway characteristics file. Improvements to the electronic entry of accident records into the DOT system are also planned. Such improvements will allow efficient and timely reviews.

For the interim, the Department will rely on the Offices of Maintenance and Construction field personnel to monitor their work zones and make appropriate adjustments based on their observations of accidents and traffic operations. Multiple reviews will be limited in scope until the planned improvements to the data system become available. All data collected will be retained by the Offices of Maintenance and Construction, with a copy to the Traffic Division and the Bureau of Policy and Planning's office of Inventory and Forecasting.

#### **Planning:**

As required by Section 135 of Title 23 USC, the Department identifies in its Long-Range Transportation Plan (LRP), safety and security issues, including work zone safety, and actions being taken to address them. Also, the State 2007 Master Transportation Plan (MTP) identifies safety and mobility needs among the primary principles the Department has committed to strive towards. Work Zone Safety and Mobility is presented as one component of "Transportation Safety and Security Programs and Plans". Updates of these plans will address work zone safety and mobility as a component of "Transportation Safety Programs and Plans".

The State LRP and MTP will identify and discuss actions that the Department has taken or plans to take to comply with the FHWA September 9, 2004 Final Rule on WZS&M. The Department's actions and plans to comply with work zone safety-related regulations required by SAFETEA-LU will be discussed in these plans, as will work zone safety programs undertaken with any funding received from U.S. Department of Transportation Work Zone Safety Grants program.

A preliminary determination of "significance" as it relates to WZS&M will be made for each roadway component of the study corridor near-term and long-term roadway project recommendations. Based upon the following definition of a "**significant project**" as established by the Department WZS&M policy in accordance with the FHWA Final Rule:

*A stationary highway construction or maintenance activity which causes sustained mobility impacts on I-84, I-91, I-95, I-691, I-291, or I-384 for more than 3 days with either intermittent or continuous lane closures. In*

*addition, any highway construction or maintenance activity that alone or in combination with other concurrent activities nearby, which is expected based on engineering judgment, to cause sustained mobility impacts that are considered greater than what is considered tolerable relative to typical traffic operations experienced in the area of the work zone, may be declared a significant project.*

WZS&M will be addressed in initial planning studies and in the NEPA/CEPA documentation processes as part of an assessment regarding project Constructability, and Maintenance and Protection of Traffic, for each roadway component (near-term and long-term) of the recommended action(s). In determining the significance of a recommended roadway action(s) at the planning phase of project development, consideration will be given to:

- recommended project(s) definition and scope, for each near-term and long-term component;
  - whether the recommended action(s) meets the definition of significance in accordance with the Department WZS&M policy;
  - whether the recommended action(s) is on existing or new alignment;
  - the primary type of travel being served (e.g. commuter / recreational / affected stakeholders);
  - the existing and predicted future No-Build hourly traffic volumes and vehicle types, and roadway capacity along the study corridor major routes (including the primary corridor, parallel corridors, alternate routes);
  - the availability of other than roadway modes for travel; and
  - possible other planned/scheduled projects in the study area.
- A qualitative assessment will be made regarding the "significance" of each component (near-term and long-term) of the recommended action. A determination will be made regarding the anticipated need (or not) for a specific WZS&M Transportation Management Plan (TMP) as it relates to each component of the recommended action (near-term and long-term). Possible elements of a TMP will be presented for consideration during further development of the project(s) through preliminary engineering, preliminary design and final design processes.

### **Preliminary Engineering/Preliminary Design**

The determination of "significance" for recommended transportation improvement modifications previously made during the planning stage will be reviewed for reconfirmation or modification during the preliminary engineering/preliminary design phases as the scope and limits of the project are more clearly defined. For those projects that did not involve a planning stage, an initial determination of significance will need to be made and documented in the Recommended Project Memorandum.

During the preliminary engineering/preliminary design phases, development of the Transportation Management Plan (TMP), including the appropriate preliminary TTC Plan, TO Plan, and PO/PI Program are initiated. Available data collected from similar projects will be reviewed and used in developing this information. Alternative roadway routes, as well as alternative modes of transportation (e.g., rail, bus, and ferry) will be identified as a component of the TMP. Bicycle and pedestrian access will also be addressed.

Confirmation of the determination of significance and the development of the TMP will be documented at the initial project scoping and at the preliminary design/design approval stages. Any change from the initial determination of significance will be approved by the Engineering Administrator.

### **Final Design**

Once again during the final design, the determination of "significance" for recommended transportation improvement modifications made during the preliminary engineering/preliminary design phases will be reviewed for reconfirmation or modification. During this phase, the TMP will be finalized, including the appropriate final TTC Plan(s), TO Plan, and PO/PI Program. The specific work zone limits shall be defined for each construction project.

Appropriate documentation confirming the determination of significance and relating to the development of the TMP will be included in the final design report and in the Stewardship Agreement Checklist. Any change in the determination of significance will be approved by the Engineering Administrator.

Regarding the development of the TMP, it is recognized that each improvement project may present unique considerations; as such, developing the TMP is an iterative process that evolves as the design progresses. However, for purposes of uniformity, standardization of TMPs for projects with similar scopes should be considered.

### **Construction:**

As a significant project progresses into the construction phase, special consideration will be given in terms of design and constructability review, inspection staffing, monitoring and reporting procedures for field activity and general oversight and administration.

Within the design review process, construction staff will ensure that Plans, Specifications and Estimates (PS&E's) include appropriate pay items to implement the Transportation Management Plan (TMP). On active projects, Construction and the Contractor will each designate a trained person (Responsible Person) to properly implement the TMP. In addition to the

inspection of Temporary Traffic Control (TTC) and Transportation Operation (TO) components of the TMP, Construction will take the lead in the coordination and implementation of Public Awareness (PI) strategies. Construction will monitor and collect data on work zone incidents for the purpose of identifying problematic trends and implementing appropriate adjustments.

All data collected will be retained by the Office of Construction, with a copy to the Traffic Division and the Bureau of Policy and Planning's office of Inventory and Forecasting

**Maintenance:**

A review of all maintenance and utility activities will be conducted. During the earliest possible stages of the review, it will be determined if the scope of work to be performed is within the Department's definition of "significant project" as it applies to the final rule. Final approval of the determination will be made by the District Maintenance Director.

The TMP for significant maintenance or utility projects will consist of a TTC plan with a PI / PO component. This plan will also apply to permit activities.

Maintenance will monitor and collect data on work zone incidents for the purpose of identifying problematic trends and implementing appropriate adjustments. All data collected will be retained by the Office of Maintenance with a copy to the Traffic Division and the Bureau of Policy and Planning's office of Inventory and Forecasting

**Exceptions:**

The FHWA Final Rule provides for an exception process for those Interstate system projects, or classes of projects, that are deemed to be significant according to the Rule or Department Policy, but in reality, may not have a high level of sustained work zone impacts. For such projects that are classified as "significant" as applied to work zone safety and mobility, through the application of this provision, but in the judgment of the Department they do not cause sustained work zone impacts, the Department may request an exception, from the FHWA Division Office, to the requirements triggered by the classification. Exceptions to these provisions may be granted by the FHWA Division Office based upon the Department's ability to demonstrate that the specific Interstate system project or categories of Interstate system projects do not have sustained work zone impacts. The Department can submit to the FHWA Division Office, qualitative and/or quantitative criteria documentation to demonstrate that the specific project or categories of projects will not have sustained work zone impacts.

**Appendix A:** Implementation – Office Assignments

**Appendix B:** Training Needs

**Appendix C:** Acronyms



## **APPENDIX A**

### **IMPLEMENTATION – ASSIGNMENTS**

This information is intended to provide general guidance regarding the responsibilities of the various ConnDOT stakeholders involved in the implementation of the WZS&M Final Rule. The specific mechanism(s) for implementation must be developed by the individual offices.



**WORK ZONE SAFETY AND MOBILITY**

**IMPLEMENTATION PLAN – DIVISION ASSIGNMENTS**

<u>CONNDOT DIVISION</u>	<u>FUNCTIONS</u>	<u>WZS &amp; M RESPONSIBILITIES / ASSIGNMENTS</u>
PLANNING		
SYSTEMS INFORMATION	<ul style="list-style-type: none"> <li>▪ Systems Inventory.</li> <li>▪ Accident records.</li> <li>▪ Traffic Data Collection</li> <li>▪ Traffic Data Monitoring.</li> <li>▪ Census/Modeling.</li> <li>▪ Trip Analysis.</li> <li>▪ GIS/Computer Systems.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Training</li> <li>▪ Data Collection and Retention.</li> <li>▪ Assist in Developing Electronic Documentation and Queries.</li> <li>▪ Project WZ Limits – Electronic (GIS) mapping and database.</li> </ul>
POLICY	<ul style="list-style-type: none"> <li>▪ STIP.</li> <li>▪ Long Range / Master Plans</li> <li>▪ Legislative Analysis.</li> <li>▪ State / Federal Funding Programs.</li> <li>▪ Field Coordination (RPOs).</li> <li>▪ Safety Program.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Training</li> <li>▪ Address WZS&amp;M in Long Range and Master Plans.</li> <li>▪ Include in Strategic Highway Safety Plan (SHSP) and in the 2008 Highway Safety Plan (HSP)*.</li> </ul>
INTERMODAL (PROJECT) PLANNING	<ul style="list-style-type: none"> <li>▪ Aviation / Ports.</li> <li>▪ Transit. / Bike &amp; Pedestrian.</li> <li>▪ Location (Highway).</li> <li>▪ Security / Evacuation Planning.</li> </ul>	<p>* Note: Work Zone Safety Grants are available to qualifying municipalities on a one-time basis.</p>
ENVIRONMENTAL PLANNING	<ul style="list-style-type: none"> <li>▪ Environmental / Historic Documents.</li> <li>▪ Water Resources.</li> <li>▪ Water Compliance.</li> <li>▪ Air and Noise Analysis</li> </ul>	<ul style="list-style-type: none"> <li>▪ Training</li> <li>▪ Studies Documentation –               <ul style="list-style-type: none"> <li>- Provide Preliminary determination of “Significant Project”.</li> <li>- Constructability Review.</li> </ul> </li> <li>▪ Studies Documentation –               <ul style="list-style-type: none"> <li>- Provide Preliminary determination of “Significant Project”.</li> <li>- Constructability Review.</li> </ul> </li> </ul>
ASSET MANAGEMENT	<ul style="list-style-type: none"> <li>▪ Document and Maintain Department Assets Inventory and Determine Financial Investment Needs (5).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Training</li> <li>▪ To Be Determined.</li> </ul>

**WORK ZONE SAFETY AND MOBILITY**

**IMPLEMENTATION PLAN – DIVISION ASSIGNMENTS (Continued)**

<b><u>CONNDOT DIVISION</u></b>	<b><u>FUNCTIONS</u></b>	<b><u>WZS &amp; M RESPONSIBILITIES / ASSIGNMENTS</u></b>
<b>ENGINEERING</b>	<ul style="list-style-type: none"> <li>▪ Define Project Scope and Limits.</li> <li>▪ Funding.</li> <li>▪ Preliminary Engineering.</li> <li>▪ Traffic Analysis.</li> <li>▪ Preliminary Design.</li> <li>▪ Final Design.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Training.</li> <li>▪ Determination/Verification of project "significance".</li> <li>▪ Stewardship Agreement.</li> <li>▪ Work Zone mapping.</li> <li>▪ Operational analysis of collected data.</li> <li>▪ Develop TMP, including TTC, TO and PI.</li> <li>▪ Public Outreach.</li> </ul>
<b>CONSTRUCTION</b>	<ul style="list-style-type: none"> <li>▪ Project Administration.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Training.</li> <li>▪ Implement TMP.</li> <li>▪ Public Outreach.</li> <li>▪ Data Collection and dissemination.</li> </ul>
<b>MAINTENANCE</b>	<ul style="list-style-type: none"> <li>▪ Daily facility maintenance and repairs.</li> <li>▪ Project Administration.</li> </ul>	<ul style="list-style-type: none"> <li>▪ Training.</li> <li>▪ Determination/Verification of project "significance".</li> <li>▪ Stewardship Agreement?</li> <li>▪ Work Zone mapping.</li> <li>▪ Operational analysis of collected data.</li> <li>▪ Develop TMP, including TTC, TO and PI.</li> <li>▪ Public Outreach.</li> </ul>

## **APPENDIX B**

### **TRAINING NEEDS**

This information is intended to provide general overview of the extent of initial and subsequent training needs to of the various ConnDOT stakeholders involved in the implementation of the WZS&M Final Rule. The specific mechanism(s) for implementation must be developed by the individual offices.



**Work Zone Safety and Mobility**

**ANTICIPATED TRAINING NEEDS**

**Bureau of Policy and Planning**

<u>ConnDOT Division</u>	<u>FUNCTIONS</u> <i>(Estimated Number of Positions)</i>	<u>TRAINING NEEDS</u>
4202/57522 (Systems Information)	<ul style="list-style-type: none"> <li>▪ Systems Inventory (10)</li> <li>▪ Accident records (12)</li> <li>▪ Traffic Monitoring (16)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Data Collection needs</li> <li>▪ Electronic Documentation and Queries</li> </ul>
4203/57523 (Systems Information)	<ul style="list-style-type: none"> <li>▪ GIS/Computer Systems (5)</li> </ul>	<ul style="list-style-type: none"> <li>▪ WZ Mapping Database – establishment and maintenance</li> </ul>
4503/57533 (Policy)	<ul style="list-style-type: none"> <li>▪ Long Range Plan / Legislative Analysis (4)</li> <li>▪ State/Federal Programs (1)</li> <li>▪ Field Coordination (4)</li> <li>▪ Safety (11)</li> </ul>	<ul style="list-style-type: none"> <li>▪ LRP/MTP Policy Statement</li> <li>▪ Funding Opportunities</li> <li>▪ Regional Coordination</li> <li>▪ Training Course / Annual Reporting?</li> </ul>
4502/57532 (Intermodal Planning)	<ul style="list-style-type: none"> <li>▪ Location (Highway) (4)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Studies Documentation (“Significant Project”)</li> </ul>
4503/57542 (Environmental Planning)	<ul style="list-style-type: none"> <li>▪ Environmental Documents/ Historic Documents (5)</li> </ul>	<ul style="list-style-type: none"> <li>▪ Studies Documentation (“Significant Project”)</li> </ul>
4601/57551 (Asset Management)	<ul style="list-style-type: none"> <li>▪ Document and Maintain Department Assets Inventory and Determine Financial Investment Needs (5).</li> </ul>	<ul style="list-style-type: none"> <li>▪ Initial Awareness Training.</li> <li>▪ Potential Future Training as Required.</li> </ul>

## Work Zone Safety and Mobility

### ANTICIPATED TRAINING NEEDS (Continued)

#### Bureau of Engineering and Highway Operations

<u>ConnDOT Division</u>	<u>FUNCTION</u> <i>(Number of Positions)</i>	<u>TRAINING NEEDS</u>
<b>ENGINEERING</b>  Unit 1400 Traffic Engineering  Unit 1300 Consultant Design  Unit 1305 State Design	TE2 (20) TE3 (15) Supervising Engineer (8)  TE3 (35) Supervising Engineer (10)  TE2 (30) TE3 (30) Supervising Engineer (12)	}  1 – Design & Operation of Work Zone Traffic Control  2 – Construction Staging
<b>CONSTRUCTION</b>  ▪ 501 Headquarters ▪ 601 District 1 ▪ 701 District 2 ▪ 801 District 3 ▪ 901 District 4	▪ Administrators/Managers (2) ▪ District Management (9) ▪ HQ Supervisors (7) ▪ District Supervisors (16) ▪ HQ Engineers -TE3 (5) ▪ District Project Engineers (44)  ▪ District Inspectors - TE2 (95) ▪ District Inspectors - TE1 (79) ▪ District Inspectors – Intern (9) ▪ HQ Engineers – TE2,TE1 (8)	▪ FHWA-NHI-380003 Design and Operation of Work Zone Traffic Control ▪ Annual presentation updating WZ policy and practice through winter “Supervisor School”.  ▪ FHWA-NHI-380063 Construction Zone Safety Inspection ▪ Annual refresher on Work Zone Traffic Control Best Practices through winter “Inspector School”.
<b>MAINTENANCE</b>  1510 1530 1610 1710 1810 1910  The training numbers reflect all sub-units within Maintenance.	▪ Administrators/Managers (27)  ▪ Gen. Supv (62) ▪ Crew Leader (128) ▪ Maint’s (990)  ▪ Planning (14) ▪ Dist Serv Agent (18)  ▪ District Traffic Engineer (4) ▪ Highway Operations (3) ▪ Dist Bridge Eng + Newington Staff (7)	▪ Roadway Safety Awareness  ▪ Work Zone Safety for Roadway Maintenance Operations  ▪ Roadway Safety Awareness Inspection  ▪ Design /Operation

## List of Acronyms

AASHTO	-	American Association of State Highway and Transportation officials
ADT	-	Average Daily Traffic
CEPA	-	Connecticut Environmental Policy Act
Department	-	Connecticut Department of Transportation
FHWA	-	Federal Highway Administration
Final Rule	-	Federal Highway Administration Work Zone Safety and Mobility Final Rule
GIS	-	Geographic Information Systems
HSP	-	Highway Safety Plan
LRP	-	Long Range Transportation Plan
MTP	-	Master Transportation Plan
NEPA	-	National Environmental Policy Act
No-Build	-	The analysis condition of imposing future (20 year horizon) traffic on the existing transportation system.
PI	-	Public Information
PO	-	Public Outreach
PS&E	-	Plans, Specifications and Estimates
SAFETA-LU	-	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SHSP	-	Strategic Highway Safety Plan
Significant	-	Significant project as defined by Department Policy on Work Zone Safety and Mobility
TMP	-	Transportation Management Plan
TO	-	Transportation Operations
TTC	-	Temporary Traffic Control Device
USDOT	-	United States Department of Transportation
WZ	-	Work Zone
WZS&M	-	Work Zone Safety and Mobility



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**APPENDIX H: SECTION 4(F) DE MINIMIS IMPACTS FINDING**

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STATE OF CONNECTICUT  
DEPARTMENT OF TRANSPORTATION



2800 BERLIN TURNPIKE, P.O. BOX 317546  
NEWINGTON, CONNECTICUT 06131-7546

Phone:

February 17, 2009

Ms. Brigid Hynes-Cherin  
Federal Transit Authority  
One Bowling Green, Room 429  
New York, New York 10004-1415

Subject: State Project No. 301-0088  
New Haven Rail Yard Improvements  
Section 4(f) De Minimis Impacts Finding Concurrence Request

Dear Ms. Hynes-Cherin:

The purpose of this letter is to document the Connecticut Department of Transportation's (Department) Section 4(f) De Minimis Impacts Finding for the above-referenced project and to request your concurrence. The Department recommends that, in accordance with Section 6009 of the Safe, Accountable, Flexible, Efficient Transportation Equity Act: Legacy for Users (SAFETEA-LU) and the associated Federal Transit Administration (FTA) - Federal Highway Administration (FHWA) joint guidance dated December 2005, a Section 4(f) De Minimis Impacts Finding is appropriate for this project. The subject project is being funded, in part, with federal funds administered by FTA. The project is currently the subject of a Federal Environmental Assessment which is currently being prepared.

The project involves a series of changes to the existing rail yard in order to accommodate the continued maintenance of the existing M-2, M-4, and M-6 rail cars, and the future storage and maintenance of the next generation of rail cars, the M-8s. The first deliveries of the fleet of M-8s will take place in 2009. As the M-8s arrive, the aging M-2s will be phased out. The M-8 cars require different storage needs, maintenance facilities and maintenance equipment than the New Haven Rail Yard currently provides.

### **Project Purpose and Need**

The purpose of the New Haven Rail Yard improvements is to transform and expand the existing New Haven Rail Yard into a fully functional and coordinated facility that provides for efficient and effective storage, dispatching, inspection, maintenance and cleaning of an increasing fleet of rail cars. The improvements will provide the space, equipment, and

administrative support structure needed to operate and maintain a new generation of rail cars, and will coordinate the new facilities with the existing facilities.

The Department's proposed program of improvements to the New Haven Rail Yard will support rail transit services in Connecticut well into the twenty-first century. The new generation of M-8 electric multiple-unit (EMU) rail cars will replace the existing M-2 fleet of cars originally procured in the early 1970s. The M-2 cars were designed to operate for thirty years, and have exceeded their life expectancy. The increase in the fleet size will overwhelm the already inadequate rail car maintenance and inspection facilities, as well as the rail yard tracks needed to store and prepare train sets for revenue service. The project will address existing compliance, location, operational and space deficiencies.

The New Haven Rail Yard was selected as the appropriate facility for the M-8 fleet because New Haven is the northeastern-most terminus of the Metro-North rail line, which logically dictates efficiency in providing storage, dispatching, inspection, maintenance, cleaning and support functions. This terminus operates on an approximately 74-acre parcel of land that currently functions as a rail yard owned by the Department, and is the connecting point for Shore Line East and the proposed New Haven-Hartford-Springfield commuter rail lines.

#### **Section 4(f) Resources and Impacts**

Potential historic, architectural and archaeological resources located within the vicinity of the New Haven Rail Yard improvements were comprehensively investigated by the Department in the 1990s, in order to properly manage important cultural resources during modernization efforts at the rail yard. During those investigations, the New Haven Rail Yard was identified as a significant example of Connecticut's late nineteenth and early twentieth century railroad-related technology. The New Haven Rail Yard was determined eligible for the National Register of Historic Places as a complex of interrelated buildings and potential archaeological remains. The Department coordinated extensively with the State Historic Preservation Office (SHPO) to assure that proper mitigation documentation took place for this historic resource.

Among the mitigation measures was the preparation of a Historic American Engineering Record for the New Haven Rail Yard (HAER No. CT-160, Public Archaeology Survey Team, 2006), which states that the following: The New Haven Rail Yard's historical significance derives from its role in the operations of the New York, New Haven, and Hartford Railroad, commonly called the New Haven Railroad. During the late 1800s, the New Haven Railroad grew to achieve a near monopoly of rail service in southern New England, providing both passenger and freight service within this densely industrialized region. Prior to the early 1900s, the New Haven Rail Yard was the railroad's largest and most complete shop complex. The New Haven Rail Yard was the site of construction for large numbers of locomotives and freight cars, and of repair and general maintenance of rolling stock.

The capabilities of the New Haven Rail Yard shops were vital in maintaining the railroad's viability at two critical points of the New Haven Railroad's history in the 1900s. After World War One, when the railroad found itself with an aged and obsolete freight car fleet but no capital for purchasing new equipment, the railroad initiated its own large-scale freight-car

construction and rebuilding program. It improved and expanded the shops at New Haven, which became the center for the program. In the early 1960s, short on locomotive power, the railroad undertook another rebuilding program. This one focused on rebuilding its pioneering electric locomotives. The rebuilding of the EP-5 passenger locomotives and the refurbishing of the EF-4 freight locomotives took place at the Lamberton Street shops. The more efficient electric service (compared to all diesel) postponed, for a short while, the company's ultimate descent into bankruptcy.

Investigations for this Environmental Assessment / Environmental Impact Evaluation identified one contributing historic resource in the New Haven Rail Yard complex to be affected by the improvements, which was not previously documented and mitigated. This resource is the Stores Facility, also known as Building 10 (see enclosed figure). Built in 1947, Building 10 was one of the long, narrow structures in the area of the historic Lamberton Street Shops. As part of the shops' complex, the building played a role in constructing and rebuilding the New Haven Railroad's rolling stock, which was critical to the railroad's success and longevity in the late nineteenth and early twentieth centuries. After World War I, in the 1920s, over 12,000 boxcars were refurbished at the Lamberton Street Shops, a cost-cutting measure that helped the company forestall bankruptcy and saved the yard from imminent closure.

### **De Minimis Impacts Determination**

After reviewing the potential effects of the project on Building 10, which requires demolition of the building, SHPO issued a conditional determination of no adverse effect, indicating no adverse effect if mitigation is implemented. The mitigation stipulated by SHPO was the historic documentation of the building to state-level professional standards (see enclosed correspondence from SHPO dated November 28, 2006). The Department submitted this documentation and SHPO subsequently approved the mitigation measures. (see correspondence from SHPO dated May 31, 2007).

Building 10 currently provides for material storage, office space, training space and as a support shop for mechanical work for rail fleet maintenance and upgrade. Building 10 was not built for these uses, and the building configuration is not optimal for the functions it currently serves. The storage area is insufficient for current and future material, as well as spare part storage. In the future, these functions will be relocated into new and expanded facilities to provide for enhanced safety and efficiency. In order to accommodate the future maintenance needs of the new M-8 fleet, the existing storage yard needs to be expanded and upgraded, including the installation of electrified tracks. This expansion is proposed to spread from the new Running Repair Shop to the Diesel Shop, and requires the proposed demolition of Building 10 to provide for sufficient track capacity for the expanded fleet of rail cars. There are no other locations at the New Haven Rail Yard that would be feasible for situating the storage yard expansion.

An alternative to provide sufficient car storage on another location at the yard would require extensive reconfiguration of the historic track patterns and would be prohibitively expensive. As such, there are no prudent and feasible alternatives to the demolition of Building 10.

Considering that all mitigation measures addressed in the Memorandum of Agreement were approved by SHPO and all mitigation required by SHPO for a determination of no adverse effect for Building 10 has been satisfied, the Department believes that the proposed improvements to the New Haven Rail Yard qualify for a *de minimis* finding. Furthermore, the use of the property has not changed and the Department has pursued impact avoidance, minimization, enhancement, and mitigation options, to the extent possible. Based on the foregoing analysis, the Department recommends that a Section 4(f) De Minimis Impacts Finding be approved by FTA for the project.

The Department looks forward to your consideration of this matter. Should you have questions or need additional information, please contact Mr. Keith T. Hall, Transportation Supervising Planner, at (860) 594-2926.

Very truly yours,



Edgar T. Hurle  
Transportation Planning Director  
Bureau of Policy and Planning

Concurrence:

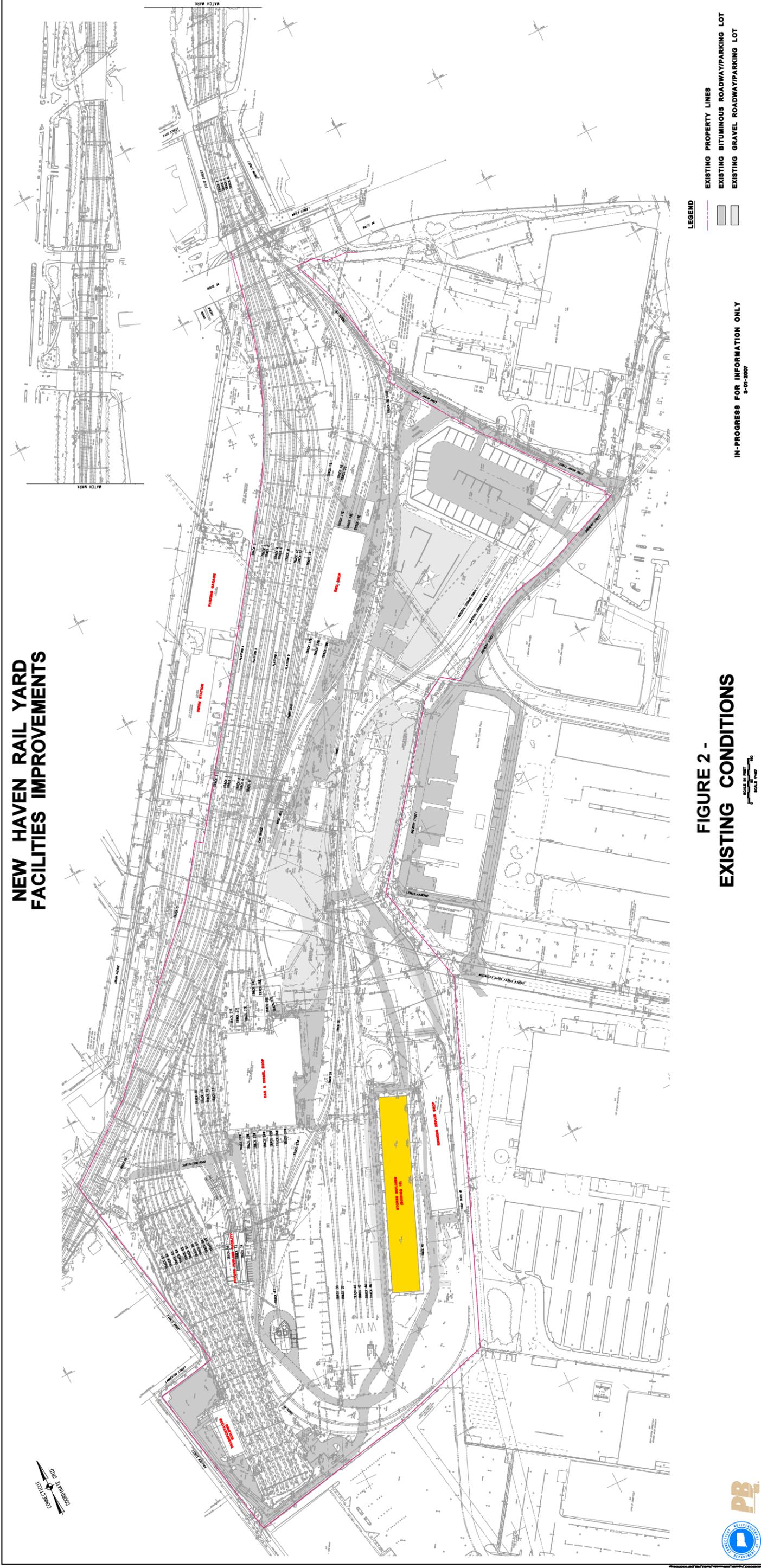
\_\_\_\_\_  
Brigid Hynes-Cherin  
Regional Administrator  
Federal Transit Administration

Date: \_\_\_\_\_

Enclosures

cc: Mr. David Bahlman - SHPO

# NEW HAVEN RAIL YARD FACILITIES IMPROVEMENTS



CONNECTION  
 0 10 20 30 40 50  
 FEET

**FIGURE 2 -  
 EXISTING CONDITIONS**

- LEGEND**
- EXISTING PROPERTY LINES
  - EXISTING BITUMINOUS ROADWAY/PARKING LOT
  - EXISTING GRAVEL ROADWAY/PARKING LOT
- IN-PROGRESS FOR INFORMATION ONLY  
 9-01-2007





Connecticut Commission on Culture & Tourism

May 31, 2007

Mr. James H. Norman  
State Design  
ConnDOT  
2800 Berlin Turnpike  
Newington, CT

Subject: Stores Facility - Building 10  
New Haven Rail Yard  
New Haven, CT  
ConnDOT #301-0088

Historic Preservation  
& Museum Division

59 South Prospect Street  
Hartford, Connecticut  
06105

(v) 860.566.3005  
(f) 860.566.5078

Dear Mr. Norman:

The State Historic Preservation Office acknowledges receipt of the narrative text and digital photographs provided by Fitzgerald & Halliday Inc. concerning the above-named project. This office believes that the submitted materials are consistent with our documentation standards and succinctly record the historic and architectural aspects of the Stores Facility - Building 10.

The State Historic Preservation Office has transferred the documentation materials to the Thomas J. Dodd Research Center at the University of Connecticut (Storrs) for permanent archiving and public accessibility.

This office believes that ConnDOT has satisfied the mitigative measure stipulated in our previous review, dated November 28, 2006, for the proposed undertaking. We appreciate ConnDOT's efforts to professionally manage and document Connecticut's cultural heritage.

This comment updates and supersedes all previous correspondence for the proposed undertaking.

For further information please contact Dr. David A. Poirier, Staff Archaeologist.

Sincerely,



Karen Senich  
Deputy State Historic Preservation Officer

cc: Ms. Cynthia Holden/ConnDOT





Connecticut Commission on Culture & Tourism

November 28, 2006

Mr. James H. Norman  
State Design  
ConnDOT  
2800 Berlin Turnpike  
Newington, CT

Historic Preservation  
& Museum Division

Subject: Stores Facility - Building 10  
New Haven Rail Yard  
New Haven, CT  
ConnDOT #301-0088

59 South Prospect Street  
Hartford, Connecticut  
06106

(v) 860.566.3005  
(f) 860.566.5078

Dear Mr. Norman:

The State Historic Preservation Office has reviewed the above-named project. This office notes that the Stores Facility (Building 10) possesses historic importance as a contributing resource to the New Haven Rail Yard, which is eligible for the National Register of Historic Places.

In the opinion of the State Historic Preservation Office, the proposed modification and subsequent demolition will effect the historic integrity of the Stores Facility (Building 10). However, this office believes that the proposed actions will constitute no adverse effect on Connecticut's cultural heritage. This comment is conditional upon the professional implementation of the following mitigative measure:

- o Prior to project-related activities, ConnDOT shall document the Stores Facility (Building 10) to the professional standards of the State Historic Preservation Office. Documentation shall consist of narrative text, photographs and/or high-quality digital images (exterior and interior perspectives and pertinent details), an index of photographs, and a photographic site plan. Final documentation shall be provided to the State Historic Preservation Office for permanent archiving and public accessibility.

For further assistance please contact Dr. David A. Poirier, Staff Archaeologist.

Sincerely,

J. Paul Loether  
Division Director and Deputy  
State Historic Preservation Officer

cc: Ms. Cynthia Holden/ConnDOT